دولـــة ليـبـيـا

وزارة التعليم العالي والبحث العلمي

جامعة طرابلس

كلية تقنية المعلومات

تقرير حول نتائج أعمال لجنة تطوير مناهج الكلية

إعداد: لجنة تطوير المناهج

29 مـايـو 2014

جـدول المحتـويات

ملخص عام

الحمد للّه العليم الحكيم، الذي علم بالقلم، علم الإنسان ما لم يعلم، والصلاة والسلام على خير معلم وأفضل مربٍ وعلى آله وصحبه وسلم تسليمًا كثيرًا.

في ضوء الرؤية الخاصة بالكلية بان تكون متميزة علميا في مجالها ونظرا للتغير السريع والكبير في مختلف مجالات تقنية المعلومات رأت الأقسام العلمية بالكلية ضرورة تحديث وتطوير مناهج الكلية حتى تواكب احدث ما توصل إليه العلم في المجال. وكذلك لتوفر للسوق المحلي والعالمي فنيين ذوي كفاءات ومهارات مميزة في مجال تقنية المعلومات.

فقد تشكلت لجنة لتطوير مناهج الكلية بقرار رئيس الجامعة رقم 343 لسنة 2013. وقد عقدت اللجنة اجتماعها الأول بعد إعادة تشكيلها في يوم الثلاثاء الموافق 2013/9/3 وقد انتهت أعمالها بتاريخ 2014/5/29.

فهذا التقرير هو ثمرة للمجهود الكبير والعمل الدؤوب والشاق الذي قام به جميع أعضاء اللجنة كل في مجاله وعلى مدى التسعة أشهر الماضية. مسترشدين لانجاز هذا العمل بتوصيات المؤسسات المرجعية و المتخصصة في المجال و المشهود لها دوليا بالخبرة والكفاءة ووفقا لمعايير الجودة لضمان الحصول على اعتماد برامجنا التعليمية مستقبلا.

حيث تم تطوير مناهج قسمان علميان هما: قسم الشبكات وقسم هندسة البرمجيات. بالاضافة إلى اقتراح مناهج لثلاثة أقسام علمية جديدة هي: قسم تقنيات الانترنت وقسم الحوسبة المحمولة وقسم نظم المعلومات.

وفي الختام نقول الحمد للّه الذي بنعمته تتم الصالحات

والسلام عليكم ورحمة اللّه وبركاته

لجنة تطوير المناهج بكلية

تقنية المعلومات

مـقدمـة

تعتبر كلية تقنية المعلومات من احدث كليات جامعة طرابلس حيث انشئت بموجب قرار اللجنة الشعبية العامة للتعليم العالي سابقا رقم 535 لسنة 2007 بشأن استحداث كليات تقنيات المعلومات بالجامعات الأساسية في ليبيا. وقد بدأت الكلية بالتدريس فعليا وقبول الطلاب مع بداية فصل الخريف 2008.تكونت الكلية منذ انشائها وحتى الان من ثلاثة اقسام ، هي: قسم الشبكات ، قسم علوم الحاسب الالي وقسم هندسة البرمجيات.

نظام الدراسة بالكلية يتبع نظام الفصل الدراسي المفتوح. حيث تمنح الكلية درجة الاجازة المتخصصة (الجامعية) في تقنية المعلومات. وللحصول على الدرجة على الطالب انجاز 135 وحدة دراسية بنجاح (على الاقل) في احد التخصصات سالفة الذكر.

اللغة العربية هي لغة الدراسة بالكلية ويجوز استخدام اللغة الانجليزية الى جانبها. اما مدة الدراسة بالكلية فهي ثـمانية فصول دراسية .

الرؤية

نطمح ان نكون كلية متميزة علميا محليا وإقليميا ، تساهم بفاعلية في خدمة المجتمع وتنميته ونهضته.

الرسالة

دعم البحث العلمي وتوفير البيئة المناسبة لإنتاج المعرفة وتعليمها وتطبيقها بما يخدم الفرد والمجتمع.

الأهداف

- إعداد الكفاءات والمهارات العلمية في مجال تقنية المعلومات تلبية لحاجات المجتمع.
- تقديم الاستشارات الفنية لمؤسسات الدولة والمجتمع المدني.
- انشاء شراكات مع المؤسسات التعليمية المناضرة و المؤسسات العاملة في مجال تقنية المعلومات لدعم برامجنا التعليمية والتدريبية.
- اقامة المؤتمرات والندوات وورشات العمل والدورات في مختلف مجالات تقنية المعلومات.

الاقسام العلمية

كما سلف الذكر توجد حاليا بالكلية ثلاثة اقسام ، هي: قسم الشبكات ، قسم علوم الحاسب الالي وقسم هندسة البرمجيات. وقد قرر المجلس العلمي للكلية تجميد العمل بقسم علوم الحاسب نظرا لقلة اقبال الطلاب عليه وكذلك لوجود قسم مناضر له بكلية العلوم.

كما تمت التوصية باستحداث ثلاثة اقسام علمية جديدة وذلك لحاجة سوق العمل الماسة لخريجي هذه الاقسام في القطاعين العام و الخاص على السواء. اضافة الى تقديم برامج تعليمية مميزة ومتميزة عن ما يقدم من برامج في هذه الجامعة و في الجامعات المناضرة. وهذه الاقسام هي:

1. قسم الحوسبة المحمولة.
2. قسم تقنيات الانترنت.
3. قسم نظم المعلومات.

وينصب عمل هذه اللجنة بالاساس على تطوير مناهج الاقسام القائمة ، بالاضافة الى اقتراح مناهج للاقسام المستحدثة حيث يشرف كل قسم من هذه الاقسام على برنامج دراسي واحد حاليا و يجوز له افتتاح برامج جديدة وفقا للاجراءات المتبعة.

الخطة الدراسية

تحوي الخطة الدراسية للكلية جميع المقررات التي يجب على الطالب اجتيازها قبل التخرج. كما تفصّل الخطط الدراسية الخاصة بالاقسام وتوزيع المقررات على الفصول الدراسية الثمانية.

بلغ عدد المقررات الاجمالي 45 مقررا بالاضافة الى مشروع التخرج بما يكافئ 135 وحدة دراسية ، منها اربع مقررات تمثل متطلبات جامعية واربعة وعشرون مقررا تمثل متطلبات الكلية و ثمانية عشر مقررا تمثل متطلبات التخصص (القسم).

ترميز المقررات

يتكون رمز المقرر من اربعة أحرف وثلاثة أرقام مثل (ITGS123) حيث أتبع في ترميز المقررات الاسلوب التالي:

- الحرفان الاول والثاني للدلالة على الكلية (IT)
- الحرفان الثالث والرابع للدلالة على القسم حيث يرمز لقسم:
  - العلوم العامة بالرمز GS
  - تقنيات الانترنت بالرمز WT
  - الحوسبة المحمولة بالرمز MC
  - الشبكات بالرمز NT
  - نظم المعلومات بالرمز IS
  - هندسة البرمجيات بالرمز SE
- الارقام الثلاثة فتقرأ من اليسار الى اليمين بحيث يدل كل رقم على:
  - الرقم الاول: مستوى المقرر أي السنة الاولى 1 والثانية 2 وهكذا.
  - الرقم الثاني:موقع المقرر (الفصل الدراسي) حسب الخطة 1 للخريف و 2 للربيع ، اما 0 فيستخدم للمقررات الاختيارية.
  - الرقم الثالث: تسلسل المقرر داخل فصل معين.

- المقررات التي تتبع كليات/اقسام اخرى كمتطلبات الجامعة فتحتفض برمزها ويضاف اليها الرمز الدال على الكلية مثلا (ITPH111).

تصنف المقررات الواردة بالخطة الدراسية الى احد الاصناف التالية:

- متطلبات الجامعة بما يعادل ثمانية وحدات كما هو وارد بالجدول رقم 1.
- متطلبات الكلية بما يعادل اثنان وسبعون وحدة كما هو وارد بالجدول رقم 2 و بالجدول رقم 3 وتنقسم الى متطلبات:
  - عامة و
  - تخصصية
- متطلبات الاقسام بما يعادل خمسة وخمسون وحدة لكل قسم كما هو وارد بالجزء الثاني من هذا التقرير وتنقسم هذه المتطلبات الى:
  - الزامية و
  - اختيارية

جدول 1: متطلبات جامعية

رمز المقرر	إسم المقرر	إسم المقرر بالانجليزية	الوحدات	الاسبقيات
ITAR111	لغة عربية 1	Arabic Language I	2	
ITEL111	لغة إنجليزية 1	English Language I	2	
ITAR121	لغة عربية 2	Arabic Language II	2	ITAR111
ITEL121	لغة إنجليزية 2	English Language II	2	ITEL111
المجموع			**8**	

جدول 2: متطلبات الكلية العامة

رمز المقرر	إسم المقرر	إسم المقرر بالانجليزية	الوحدات	الاسبقيات
ITMM111	رياضة 1	Mathematics 1	3	-
ITMM121	رياضة 2	Mathematics 2	3	ITMM111
ITPH111	فيزياء (كهربية ومغناطيسية)	Physics (Electronic and Magnetic)	3	
ITST111	مبادئ الاحصاء و الاحتمالات	Fundamentals of statistics and probability	3	-
ITGS219	الطرق العددية	Numerical Methods	3	ITMM121, ITGS122
ITGS304	كتابة التقارير (لغة انجليزية3)	Scientific Writing	3	ITEL121
المجموع			**18**	

جدول 3: متطلبات الكلية التخصصية

رمز المقرر	إسم المقرر	إسم المقرر بالانجليزية	الوحدات	الاسبقيات
ITGS111	مقدمة في تقنية المعلومات	Introduction to Information Technology	3	
ITGS113	تقنيات حل المشاكل	Problem Solving Techniques	3	
ITGS122	مقدمة في البرمجة	Introduction to Programming	3	ITGS113
ITGS124	تحليل وتصميم نظم	System Analysis and Design	3	ITGS113
ITGS126	الدوائر المنطقية	Logic Circuits	3	ITPH111
ITGS211	البرمجة الشيئية	Object Oriented Programming	3	ITGS122
ITGS213	مقدمة في هندسة البرمجيات	Introduction to Software Engineering	3	ITGS111
ITGS215	مقدمة في الشبكات	Introduction to Networking	3	ITGS111
ITGS217	التراكيب المنفصلة	Discrete Structures	3	ITMM122
ITGS220	تراكيب بيانات	Data Structures	3	ITGS122
ITGS222	أساسيات نظم المعلومات	Foundations of Information Systems	3	ITGS111
ITGS223	معمارية الحاسوب	Computer Architecture	3	ITGS126
ITGS224	أمن المعلومات	Information Security	3	ITGS111
ITGS226	مقدمة في برمجة الانترنت	Introduction to Internet Programming	3	ITGS122
ITGS228	مقدمة في قواعد البيانات	Introduction to Databases	3	ITGS217
ITGS301	تصميم و تحليل الخوارزميات	Design and Analysis of Algorithms	3	ITGS220
ITGS302	نظم تشغيل	Operating Systems	3	ITGS223
ITGS303	إدارة مشاريع تقنية المعلومات	IT Project Management	3	ITGS213
المجموع			**54**	

ويبين الجدول رقم 4 توزيع المقررات على الفصول الدراسية الاربعة الاولى والتي تمثل المرحلة العامة.

المقررات التخصصية

تنقسم المقررات التخصصية الى مقررات الزامية بما يكافئ اربعون وحدة ومقررات اختيارية بما يكافئ خمسة عشر وحدة. الفقرات التالية توضح الخطط الدراسية الخاصة بكل قسم مدعومة بجداول تبين المقررات الاختيارية والمقررات الالزامية وتوزيع المقررات على الاربعة فصول الدراسية الاخيرة.

جدول 4: توزيع المقررات على الفصول الدراسية الاربعة الاولى

	رمز المقرر	إسم المقرر	إسم المقرر بالانجليزية	الوحدات	الاسبقيات
الفصل الاول	ITGS111	مقدمة في تقنية المعلومات	Introduction to Information Technology	3	
	ITGS113	تقنيات حل المشاكل	Problem Solving Techniques	3	
	ITMM111	رياضة1	Mathematics I	3	
	ITPH111	فيزياء (كهربية ومغناطيسية)	Physics (Electronic and Magnetic)	3	
	ITAR111	لغة عربية 1	Arabic Language I	2	
	ITEL111	لغة إنجليزية 1	English Language I	2	
الفصل الثاني	ITGS122	مقدمة في البرمجة	Introduction to Programming	3	ITGS113
	ITGS124	تحليل و تصميم نظم	System Analysis and Design	3	ITGS113
	ITGS126	الدوائر المنطقية	Logic Circuits	3	ITPH111
	ITMM122	رياضة2	Mathematics II	3	ITMM111
	ITAR122	لغة عربية 2	Arabic Language II	2	ITAR111
	ITEL122	لغة إنجليزية 2	English Language II	2	ITEL111
الفصل الثالث	ITGS211	البرمجة الشيئية	Object Oriented Programming	3	ITGS122
	ITGS213	مقدمة في هندسة البرمجيات	Introduction to Software Engineering	3	ITGS111
	ITGS215	مقدمة في الشبكات	Introduction to Networking	3	ITGS111
	ITGS217	التراكيب المنفصلة	Discrete Structures	3	ITMM122
	ITGS219	الطرق العددية	Numerical Methods	3	ITMM122, ITGS122
	ITST211	مبادئ الاحصاء والاحتمالات	Introduction to Statistics and probability	3	ITMM111
الفصل الرابع	ITGS220	تراكيب بيانات	Data Structures	3	ITGS122
	ITGS222	أساسيات نظم المعلومات	Foundations of Information Systems	3	ITGS111
	ITGS223	معمارية الحاسوب	Computer Architecture	3	ITGS126
	ITGS224	أمن المعلومات	Information Security	3	ITGS111
	ITGS226	مقدمة في برمجة الانترنت	Introduction to Internet Programming	3	ITGS122
	ITGS228	مقدمة في قواعد البيانات	Introduction to Databases	3	ITGS217

توصيف المقررات العامة

Course title	Mathematics I (Calculus)		
Course code	ITMM111	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	None		
Department	General sciences		
Course Description: Inequalities, function, domain, range, limits, continuity, derivatives, chain rule, higher derivatives, implicit differentiation, trigonometric functions, maxima. Minima, point of inflection, curve sketching, role's theorem, mean value theorem. Indefinite and definite integrals: definition "simple cases", area between two curves, integration by substitution, by parts: applications.			

Course title	Mathematics II (Linear Algebra)		
Course code	ITMM121	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	Mathematics I		
Department	General sciences		
Course Description: Vector Calculus: Vector Function. Derivative of a Vector function. Gradient of a scalar function. Divergence and curl of vector functions. Directional derivative and calculation of pressure, Kinetic interpretation of energy. Linear Algebra: integral of matrices. Addition and multiplication of matrices. Inverse of square matrix. Orthogonal, Hermition and Unitary matrices. Properties of determinants and expansion of the determinants. Solution of nonhomogeneous linear equations by Cramer's rule. Elementary operations. Echelons and reduced echelon forms. Rank of a matrix. Equivalent matrices. Gauss-Jordan elimination method. System linear homogeneous and nonhomogeneous equations vector spaces. Subspaces. Linear dependence and independence Span, Basis and Dimension. Eigen value problems Eigen vectors. Cayley - Hamilton theorem.			

Course title	Information Security		
Course code	ITGS224	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS111		
Department	General Sciences		
Course Description: This course introduces students to the basic principles and practices of computer and information security. Focus will be on the software, operating system and network security techniques with detailed analysis of real-world examples. Topics include cryptography, authentication, software and operating system security (e.g., buffer overflow), Internet vulnerability (DoS attacks, viruses/worms, etc.), intrusion detection systems, firewalls, VPN, Web and wireless security.			

Course title	Fundamentals of statistics and probability		
Course code	ITST111	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITMM111		
Department	General sciences		
Course Description: Probability: concept of a random experiment and sample space; addition and multiplication laws of probability; conditional probability and independence, Bay's theorem and its application. Random Variables and their probability: Conditional Probability; Binomial , Poisson, Hyperogeomtric, Normal , Gamma , Exponential and uniform random variables and their properties . Basic statistical concepts: Statistical data, measures of central tendency; dispersion skewness and kurtosis. Regression and Correlation: simple, linear regression; regression coefficient and correlation coefficient. Fitting of linear and curve linear regressions, Multiple linear regression and multiple. Test of Significance: Basic concepts; use of normal test and t-test for hypothesis testing for a mean and the differences of two means. Use of X2 distribution for testing independence and goodness of fit.			

Course title	IT Project Management		
Course code	ITGS303	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITGS213		
Department	General Sciences		
Course Description: This course studies how to plan and manage projects at each stage of the software development life cycle. It covers specific techniques of Planning, Organizing, Monitoring, and Adjusting phases of software projects. Topics include technical and managerial skills needed to achieve project goals. A required team project combines technical and managerial techniques of software design and development.			

Course title	Object Oriented Programming		
Course code	ITGS211	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS122		
Department	General Sciences		
Course Description: Introduction to Object-Oriented Programming, introduces students to object-oriented programming concepts, such as classes, objects, methods, interfaces, packages, inheritance, encapsulation, and polymorphism. These concepts are emphasized through extensive programmingexamples and assignments that require problem solving, algorithm development, top-down design, modular programming, debugging, and testing			

Course title	Introduction to Software Engineering		
Course code	ITGS213	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS111		
Department	General Sciences		
Course Description: This course offers an introduction to software engineering. Topics covered: Software Engineering fundamentals; Software processes; Object-oriented concepts and UML; Requirements analysis; System modeling and specification; Software design models; from design to implementation; Software testing; Software tools; Emerging software development methods; Teamwork.			

Course title	Problem Solving Techniques		
Course code	ITGS113	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code			
Department	General Sciences		
Course Description: This course introduces the student to different heuristic techniques that aid programmers and computer scientists in solving problems. The course uses classical math and word problems for generating potential solutions to "real-life" problems encountered in the profession, and problem solving in teams. Topics covered include: Errors in reasoning; verbal reasoning; analogy problems; heuristics; mathematical word problems; analysis of trends; lateral thinking; deductive and hypothetical reasoning; computational problem solving; problem solving in-the-large; generating, implementing, and evaluating solutions; discrete mathematics, statistics; interpersonal problem solving.			

Course title	Design and Analysis of Algorithms		
Course code	ITGS301	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS220		
Department	General Science		
Course Description: The module introduces formal techniques to support the design and analysis of algorithms, focusing on both the underlying mathematical theory and practical considerations of efficiency. Topics include asymptotic complexity bounds, techniques of analysis, and algorithmic strategies.			

Course title	Data Structures		
Course code	ITGS220	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS122		
Department	General Science		
Course Description: Classification of data structures, space and time considerations. Linked lists, stacks and queues. Tree structures, binary search trees. Array and pointer based implementations. Recursive applications. Sorting and searching.			

Course title	Introduction to Programming		
Course code	ITGS122	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS113		
Department	General Science		

Course Description:
An introduction to computing and program development in the C programming language. This includes a brief introduction to basic computer concepts, an understanding of the operating system sufficient for writing program. introduction to computer programming; Getting started in C programming: introduction to basic program syntax; Printing messages, data types and declarations, numeric and character data, expressions, printing results, and variables; Processing and interactive input: assignments, counting, and input and output of data; C's conditional statements; C's looping statements; Modularity using functions: user--defined functions, parameters and return values, standard library functions, scope, call--by--reference; More modularity using functions: scope, storage class, and call--by--reference; Arrays: single and two dimensional arrays, initializers, array parameters; Character strings: processing strings using loops, some character and string library functions; Structures: structure concepts, structures as parameters, arrays of structures; Additional or miscellaneous topics other material as time permits.

Course title	Introduction to Information Technology		
Course code	ITGS111	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	-		
Department	General Sciences		

Course Description:
This will be an introductory level course for students. The course provides an overview of the specialty of information technology and describes how it relates to other computing disciplines and begins to instill the mentality of Information Technology. The goal is to help students understand the different contexts in which information technology is used, and challenges inherent in the deployment of innovative technology.
Course Topics: concentration and user support; information security; models of IT systems. complexity management (abstraction and modeling , best practices and patterns and standards and the use of appropriate tools); Information Technology and Communications; The interaction between human and computer; Information Management; Networks; Technical plan (an introduction to digital computers , digital electronics); Programming; Online systems and techniques.

Course title	Computer Architecture		
Course code	ITGS223	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS126		
Department	General Sciences		

Course Description:
System-level aspects of computing systems design, interconnection structures, Cache memory principles; Main memory; External memory; Input/ Output; CPU structure and function; computer arithmetic; instruction sets: characteristics and functions; instruction sets: addressing modes and formats; Control unit operation and design; Reduced Instruction Set Computers (RISC); Instruction-Level Parallelism and Superscalar Processors.

Course title	Introduction to Networking		
Course code	ITGS215	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS111		
Department	General Sciences		
Course Description: Introduction to fundamental concepts in the design and implementation of computer communication networks, their protocols (OSI model vs TCP/IP protocol stack), applications, circuit and packet switching access networks. Introduction to Application Layer, topics include: Web, HTTP, FTP, Email, DNS, and socket programming. Introduction to Transport Layer, topics include: UDP, TCP, flow control, congestion control. Introduction to Network Layer, topics include: routing principles, IP routing, IPv4, IPv6, broadcast, multicast, unicast. Introduction to Link Layer and local area networks, topics include: error detection/correction, multiple access protocols, LAN, Ethernet. Basics of physical layer and wireless networking and related Security issues.			

Course title	Operating Systems		
Course code	ITGS302	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS223		
Department	General Sciences		
Course Description: This course deals with all essential concepts of operating systems. Starting with describing role of an operating system in managing different tasks during the processing operation. The course explains the process concept, in particular process description within an OS environment and its scheduling strategies. Also, it covers: memory management, virtual memory, I/O management and disk scheduling, file management. Mutual exclusion and synchronization, deadlock and starvation concepts and algorithms are discussed in details in this course supported with LAB work.			

Course title	Systems Analysis and Design		
Course code	ITGS124	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS113		
Department	General Sciences		
Course Description: This course provides a methodical approach to developing computer systems including feasibility study, systems planning, analysis, design, testing, implementation and software maintenance. Emphasis is on the strategies and techniques of systems analysis and design for producing logical methodologies for dealing with complexity in the development of information systems. The course includes the Waterfall model (The System Development Life Cycle), system analysis and design techniques (Process Modeling (DFDs), Logical Modeling (decision tree, decision table, structured English), Data Modeling (ERD Diagrams), Object Oriented Modeling (UML use cases).			

Course title	Logic Circuits		
Course code	ITGS126	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	None		
Department	General Sciences		
Course Description: Introduction to information representation & number systems and codes; Boolean algebra and logic gates; simplification of Boolean functions; Analysis and design of combinational logic circuits; multiplexers; Decoders and adders,; Introduction to synchronous sequential logic; flip flops; Analysis and design of clocked synchronous sequential circuits.			

Course title	Introduction to Internet Programming		
Course code	ITGS226	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS122		
Department	General Sciences		
Course Description: Introduction into internet and World Wide Web and their protocols, TCP/IP, MIME, http protocols. SGML – documents and their types. Html BASICS. CSS. Basics of Scripting languages programming. Server part of application (ASP, PHP,ASP.Net, or JSP), Web pages and accessing database(ADO and MS Access, or MySql).			

Course title	Numerical Methods		
Course code	ITGS219	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITMM121, ITGS122		
Department	General Sciences		
Course Description: This course is a programming course; students need to implement all discussed topics by any programming language in class per class fashion. This course include these topics: Introduction to error analysis, root finding methods for non-linear equations (interval halving, false position), Newton's method, definition of interpolation, Newton's-Gregory interpolation, central interpolation (Gauss forward and backward, Bessel, Stirling), Least square approximation, Spline curves, Numerical differentiation, Numerical integration (Trapezoidal method, Simpson's), Numerical solution of ordinary differential equations (Taylor's series method), Euler method, Runge-Kutta method.			

Course title	ITAR111		
Course code	Arabic Language I	Credits	2
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code			
Department	General Sciences		
Course Description: Introduction: the importance of studying Arabic, the need for mastering Arabic, the importance of Arabic in nationalistic, religious, civilization and cultural frames, the role of civilization in effacing Arabic, some grammatical rules: words, sentence structures, verbal sentences, some dictation rules, looking up words.			

Course title	ITEL111		
Course code	English Language I	Credits	2
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code			
Department	General Sciences		
Course Description: Nouns (types, function, derivations), adjectives (types, sequence, derivations) adverbs (forms, position), use and forms of the ultimate tense, interrogative formations, negative of verbs. Passive constructions (forms, usages), adjective clauses (recognition and types, case of relative pronoun), gerund phrases, infinitive phrases, listening comprehension.			

Course title	ITAR121		
Course code	Arabic Language II	Credits	2
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITAR111		
Department	General Sciences		
Course Description: Some grammar rules, nominal sentences (starters, predicates and comparing them, abrogatives), addition, numbers and specifiers, appositives, some dictation rules, dictionaries, scientific and literary styles and their application.			

Course title	ITEL121		
Course code	English Language II	Credits	2
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITEL111		
Department	General Sciences		
Course Description: Introduction and augmentation of specialized vocabulary and aspects of scientific technical English used in the different departments of engineering. Listening comprehension.			

Course title	Introduction to Databases		
Course code	ITGS228	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS217		
Department	General Sciences		
Course Description: This course introduce the fundamentals of database management system characteristics of DB approach, components of DB systems, DB architecture, Data modeling, Database users and administrators. Entity-Relationship model, Relational-Algebra, SQL Programming, Database design, Functional dependency and Normalization, Relational Database, Introduction to Object oriented database and UML, practical applications using a standard Relational DB system.			

Course title	Foundations of Information Systems		
Course code	ITGS222	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS111		
Department	General Sciences		
Course Description: Information systems are an integral part of all business activities and careers. This course is designed to introduce students to contemporary information systems and demonstrate how these systems are used throughout global organizations. The focus of this course will be on the key components of information systems - people, software, hardware, data, and communication technologies, and how these components can be integrated and managed to create competitive advantage. Through the knowledge of how IS provides a competitive advantage students will gain an understanding of how information is used in organizations and how IT enables improvement in quality, speed, and agility. This course also provides an introduction to systems and development concepts, technology acquisition, and various types of application software that have become prevalent or are emerging in modern organizations and society.			

Course title	Discrete structure		
Course code	ITGS217	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS122		
Department	General Sciences		
Course Description: This course include these topics: Number systems: natural numbers, radix r representation of integers, mathematical induction. Logic: propositional logic, predicate logic. Boolean algebra; sets; recursion; relations, and functions. Combinatory: counting principles; permutation groups. Graphs: graphs; diagraphs; trees; Euler's formula and coloring of graphs. Formal machines: automata and regular expressions; register machines: turning machines.			

Course title	Physics (magnetism and electricity)		
Course code	ITPH111	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	None		
Department	General sciences		
Course Description: Force on a point charge in an electric field, a dipole in an electric field, electric flux and electric field, Gauss's law and Coulomb's law, application of Gauss s law. Electric potential and electric field, potential due to a point charge, a group of point charges, dipole. Capacitance, spherical and parallel plate capacitors, energy stored in an electric field. Current and Current density, resistance and resistively Ohm's law. Electromotive force, potential difference, Kirchhoff's law, R-C circuit. Magnetic flux, flux density, magnetic force on a current, torque on a current loop, Hall effect, circulating charges, Thomson's experiment for measuring e/m for an electron. Ampere's law, flux density nears a long wire, two parallel conductor's flux density for a solenoid, the Biot –Savart law. Faraday's law of induction, Lenz's law, time–varying magnetic field, production of a.c. Self–inductance, mutual– inductance L- R circuit, energy and magnetic field.			

Course title	BSc Project		
Course code	ITXX500	Credits	4
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS303		
Department			
Course Description: Is an in-depth theoretical and experimental investigation of a specific problem in information technology. Developed through intensive group and / or individual studies, use of computer, analytic and experimental techniques where applicable.			

الجـــزء الأول

مقررات الأقسام المطورة

مقترح تطوير

قسم شبكات الحاسوب

إعداد : لجنة قسم شبكات الحاسوب

2014 /05/24

متطلبات دخول القسم:

يشترط لتخصص الطالب في قسم شبكات الحاسوب أن يجتاز بنجاح مادة مقدمة في الشبكات (ITGS215)

مقررات القسم التخصصية:

يستوجب على الطالب إجتياز عدد 12 مقرر كمتطلبات القسم التخصصية، بعدد 3 وحدات للمقررات النظرية ، كما هو موضح بالجدول التالي:

	Code	Subject Name	Credits	Prerequisite
Sem 5	ITNT311	Data Communication	3(3+0)	
	ITNT312	Local Area Networks	3(2+2)	ITGS215
	ITNT313	Network Programming	3(2+2)	ITGS226
	ITNT314	Encryption and Network Security	3(3+0)	ITGS224
	ITGS301	Analysis and Design of Algorithms	3(3+0)	ITGS220
Sem 6	ITNT321	Wide Area Networks	3(2+2)	ITNT312
	ITNT322	Network Protocols and Software	3(3+0)	ITNT311
	ITNT323	Digital Communication	3(2+2)	ITGS223
	ITNT324	Wireless and Mobile Communication	3 (3+0)	ITNT312, ITNT311
Sem 7	ITGS302	Operating Systems	3 (3+0)	ITGS223
	ITGS303	IT Project Management	3 (3+0)	ITGS213
	ITNT411	Distributed System	3 (3+0)	ITGS302, ITNT311
	ITNT412	Network Design and Management	3 (3+0)	ITNT321
Sem 8	ITNT421	Network QoS	3 (3+0)	ITNT322
	ITNT422	High Speed Networks	3 (3+0)	ITNT321
	ITNT500	BSc Project	4	ITGS303

مواد تخصصية إختيارية:

من ضمن المقررات الدراسية التي ينبغي على الطالب دراستها هي المواد التخصصية الاختيارية للقسم فعلى الطالب دراسة (5) مواد دراسية أختيارية من أصل (9) مواد كما هو موضح فى الجداول التالية ، كما أن القسم يقترح على الطالب دراسة المواد المدرجة في الجدول في الفصول المذكورة ، كما أن الطالب غير ملزم بهذه المقترحات و يمكن اختيار اى 5 مواد من الجدول التالي:-

	Code	Subject Name	Credits	Prerequisite
Sem 5	ITIS312	Introduction to Human Computer Interaction	3	-
Sem 6	ITIS403	Collaborative computing systems	3	-
	ITNT301	Modeling and Performance Evaluation	3(2+2)	ITNT322
Sem 7	ITNT401	Cloud Computing	3(2+2)	ITNT411
	ITNT402	Security Policy	3	ITNT314
	ITMC421	Fundamentals of Ubiquitous Computing	3	-
Sem 8	ITNT403	Wireless Sensor Networks	3(2+2)	ITNT411, ITNT324
	ITNT404	Special Topics	3	-
	ITNT405	Multimedia over IP Networks	3(2+2)	ITNT321, ITNT322

توصيف المقررات:

Course title	Data Communication		
Course code	ITNT311	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	None		
Department	Computer Networks		
Course Description: This course include design methods and implementation techniques for the exchange of data between computers in computer networks, topics include data and data types, analog and digital data, signal types (examples of analog and digital signals), periodic signal characteristics, time and frequency domain representation, spectrum and bandwidth of a signal; transmission impairments and channel capacity which include: sources of impairment, attenuation and unit of attenuation, bandwidth of a medium, distortions, data rate limits, Nyquist bit rate, bit rate and baud rate, noise sources; transmission media including guided and unguided media; conversion techniques including digital to digital, analog to digital, analog to analog, and digital to analog conversion; coding techniques including line coding, Polar, and Bipolar coding; error detection and correction including types of error, error detection techniques, error correction codes; flow and error control including flow control techniques; data communication through WAN and LAN considering issues related to switching, Routing, Congestion Control, medium access control techniques.			

Course title	Local Area Network		
Course code	ITNT312	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS215		
Department	Computer Networks		
Course Description: Introduction to Local Area Network; LAN Components; LAN Applications;Data Communication Models; Data transmission; IEEE LAN Standards; Transmission Media; Error Detection; LAN Topologies; Flow & Error Control;Medium Access Methods; Logical Link Control (LLC); Ethernet; Ethernet Evolution: Fast and Gigabit Ethernet; Token Bus; Token Ring; ATM LANs; Wireless LANs; LAN Performance; Connecting LANs; TCP/IP; Data Encryption; Network Management.			

Course title	Network Programming		
Course code	ITNT313	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS226		
Department	Computer Networks		
Course Description: Introduction to Network Programming; Transport Layer Protocols; TCP, UDP, and SCTP; Client-Server Model; TCP Sockets; UDP Sockets; SCTP Sockets; I/O Multiplexing; DNS and Address Conversion; Threads Programming; RPC, Raw Sockets and Datalink Access.			

Course title	Cryptographic Algorithms and Protocols		
Course code	ITNT314	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS224		
Department	Computer Networks		
Course Description: Cryptographic algorithms and protocols form the backbone of numerous security architectures. This course provides an introduction to modern cryptography and communication security. It focuses on how cryptographic algorithms and protocols work and how to use them. The course covers the concepts of block ciphers and message authentication codes, public key encryption, digital signatures, and key establishment, as well as common examples and uses of such schemes, including the AES, RSA-OAEP, and the Digital Signature Algorithm. Basic cryptanalytic techniques and examples of practical security solutions are explored to understand how to design and evaluate modern security solutions.			

Course title	Wide Area Networks		
Course code	ITNT321	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT312		
Department	Computer Networks		
Course Description: Introduction to Fundamentals of WANs; WAN Concepts and Components; Wired and Wireless used in WAN networks; WAN environments, WAN architectures; Components involved in WAN; Physical Layer WAN Protocols; low & high-speed options for Physical Layer MAN/WAN; Data Link Layer WAN Protocols; Differences between circuit-switched and packet- switched networks; Higher Layer WAN Protocols; WAN Solutions Wide Area Networks; Standards WANs protocols and networks- X.25, Frame Relay- ATM network protocols, services and layering- SONET/SDH layers- Frame relay operation- layers and frames- Broadband Wireless networks; Voice and Video on WAN.			

Course title	Network Protocols and Software		
Course code	ITNT322	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT311		
Department	Computer Network		
Course Description: This course covers layer 3 and 4 in TCP/IP standard architecture. Different routing principles such as Dijkstra's and Bellman-Ford algorithms are studied in this course. Moreover, IP router standard router structure is studied in this course. Students taking this course will be aware of all details about most of the routing protocols in use today in the Internet and are able to compare them. Topics covered in this course include: introduction to layering and protocols; OSI standard architecture; TCP/IP standard structure; IP protocol; TCP protocol; routing			

in IP networks; interior gateway protocols (distance vector protocols: RIP, IGRP, EIGRP)(link state protocols: OSPF); exterior gateway protocols (EGP, BGP); standard IP router structure; routing in MPLS networks. LAN

Course title	Digital Communication		
Course code	ITNT323	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS223		
Department	Computer Networks		
Course Description: This course has been designed to be offered as an integrated course covering: - SIGNAL THEORY: Representation of deterministic signals: Orthogonal representation of signals. Dimensionality of signal spaces. Construction of orthogonal basis functions. Random Processes: Definition and classification, stochastic integrals, Fourier transforms of random processes, stationary and non-stationary processes, correlation functions. Ergodicity, power spectral density, transformations of random processes by linear systems. - DIGITAL COMMUNICATION SYSTEM: characterization of communication signals, signal space representation, equalization, matched filtering, binary PSK, QPSK, FSK, QAM & M-Ary modulation techniques and their representation. Coherent & non-coherent detection, carrier & symbol synchronization, bits vs. symbol error probability, bandwidth efficiency, Spread spectrum modulation: Pseudo noise sequences, DS & FH spread spectrum. - Satellite Communication systems: satellite link: design and analysis, multiplexing techniques, multiple accesses for satellite links: FDMA, TDMA CDMA &DAMA, propagation effects, DBS-TV, GPS. VSAT: Network architecture, access control protocol & link analysis. - DIGITAL SIGNAL PROCESSING: DFT & its properties. Decimation in time and decimation in frequency FFT algorithms, discrete cosine transform. IIR Filter design: Butterworth design, bilinear transformation. Low Pass, High Pass, Band Pass and Band Stop digital filters. Spectral transformation of IIR filters. - Cellular communication systems, Microwave Communication systems			

Course title	Wireless and Mobile Communications		
Course code	ITNT324	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT312, ITNT311		
Department	Computer Networks		
Course Description: This course includes introduction to wireless communication systems and networks, topics include: introduction to wireless communications and applications, radio propagation characteristics, models for path loss, shadowing and multipath fading (delay spread, coherence bandwidth coherence time, Doppler spread), modulation techniques, cellular wireless networks and systems principles covering 1G, 2G (GSM and CDMA), 2.5G (GPRS and EDGE), 3G (WCDMA/UMTS), 3.5G (HSDPA and			

IxEVDO), 4G (LTE and Wimax), tradeoff between capacity and coverage in a cellular system, introduction to WLANs, mobile ad-hoc networks, multiple access techniques, future of mobile communications.

Course title	Distributed Systems		
Course code	ITNT411	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITGS302, ITNT311		
Department	Computer Networks		
Course Description: Introduction to distributed computing systems (DCS);Characteristics and specifications of distributed systems; architectural models of distributed models; Distributed Systems Models; Networks and Intranets; Operating Systems Support; Security in distributed systems; Distributed file systems; Domain and Addressing Services; Distributed Operations; Mobile Computing; Distributed Multimedia Systems			

Course title	Networks Management and Design		
Course code	ITNT412	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT321		
Department	Computer Networks		
Course Description: Principles of internetworking; Internetworking hardware; Bridging and switching technologies; Routing strategies. The network development life cycle. Network analysis and design methodology. Enterprise network design model. Backbone design concepts. Network security design; Network design algorithms; Standards Network Management Functions; Network Management Applications; SNMP Management Information; SNMP2 Management and Operation;SNMPv3 Documentation Architecture; SNMPv3 Management Information Base;SNMPv3 Applications; RMON SMI and MIB-RMON1-RMON2; Current Network Management; Web-Based Management; Distributed Network; Reliable; Fault Tolerant Network Management.			

Course title	Network QoS		
Course code	ITNT421	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT322		
Department	Computer Networks		
Course Description: This course addresses the topics of Quality of Service (QoS) and efficiency in networks, topics include: introduction to Internet and wireless networks. QoS architectures for the Internet including IntServ, RSVP, and Diffserv; different classes of services and their QoS requirements; algorithms to provide QoS, traffic policing and traffic shaping algorithms; leaky bucket algorithms; algorithms to provide QoS			

locally including scheduling algorithms (FIFO, RR, WRR), queuing algorithms (RED, WRED, RIO, CBQ); classification of routing protocols in communication networks from the QoS perspective, routing protocols for ad hoc networks and QoS offered by each one; understanding the effect of QoS parameters (delay, jitter delay, percentage of packet losses, throughput) and QoS metrics (distance, available bandwidth, delay, jitter delay, losses, load) on the network performance.

Course title	High Speed Networks		
Course code	ITNT422	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT321		
Department	Computer Networks		
Course Description: Innovative topics in technologies, multiplexing methods, protocols and standards of fiber networks are discussed in this course. Students taking this course will be aware of all details about new multiplexing techniques and novel standard architectures of the state-of-the-art distribution high-speed networks. Topics covered in this course include: introduction to fiber networks; basic multiplexing techniques; advanced multiplexing technique :(wavelength division multiplexing (WDM), dense wavelength division multiplexing (DWDM)); standard optical distribution networks architectures: Fiber Distributed Data Interface (FDDI), Synchronous Digital Hierarchy (SDH) standards, Synchronous Optical Network standard (SONET), Ethernet Passive Optical Network (EPON) and Gigabit Passive optical Networks (GPON); fiber networks and multimedia; optical internetworking.			

Course title	Introduction to Information Security		
Course code	ITNT301	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT314		
Department	Computer Network		
Course Description: This course introduces students to the basic principles and practices of computer and information security. Focus will be on the software, operating system and network security techniques with detailed analysis of real-world examples. Topics include cryptography, authentication, software and operating system security (e.g., buffer overflow), Internet vulnerability (DoS attacks, viruses/worms, etc.), intrusion detection systems, firewalls, VPN, Web and wireless security.			

Course title	Modeling & Performance Evaluation		
Course code	ITNT302	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITNT322		
Department	Computer Networks		
Course Description: The main focus of this course is to understand the key performance metrics and parameters used for evaluating computer networks which include topics like:			

principles and methods for simulating computer networks and data communications, random number generation to model different traffic types, simulation of queuing models, simulating real operating networks, comparing the performance of networks using different scenarios, understand computer simulation needs, implement and test a variety of simulation and data analysis libraries and programs, understand tools to view and control simulations and their results, understand and apply display forms such as tables, graphs, and multidimensional visualization, comparing two systems and screening problems.

Course title	Cloud Computing		
Course code	ITNT401	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITNT411		
Department	Computer Networks		
Course Description: The course present the state of the art in cloud computing technologies and their applications, topics include: introduction to cloud computing, Infrastructure as a Service (IaaS): resource virtualization (server, storage, network), Platform as a Service (PaaS): computation and storage, Software as a Service (SaaS): web services and web 2.0, telecommunications needs, architectural models for cloud computing, security, privacy, trust management, resource allocation and quality of service, pricing and risk management, interoperability and internetworking, legal issues, Students can familiar with cloud services and their techniques through labs and a project.			

Course title	Security Policy		
Course code	ITNT402	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT314		
Department	Computer Networks		
This course provides students with an introduction to information security policies. The course discusses the entire lifecycle of policy creation and enactment and presents students with issue specific policies in different domains of security. The structure of the policy is also discussed to assist the students in design and modification of policies. Several examples from different domains are incorporated to assist students to learn in context of real life situations. The topics covered by this course include General Overview of Policies, Policy Lifecycle, and Writing Security Policies, Information Classification and Privacy Policies, Network Security and Email Policies, Application, Operating System and Software Security Policy, Encryption and Key Management Policy, Security Policy: Audit and Compliance, Acceptable Use Policies and Training /Awareness, Security Policy: Enforcement and Effectiveness.			

Course title	Wireless Sensor Networks		
Course code	ITNT403	Credits	3
Course type	Core ☒	Required☐	Elective ☐

Prerequisites code	ITNT411, ITNT324		
Department	Computer Networks		

Course Descriptions:
Wireless sensor networks are deployed in high densities in order to obtain detailed information about the operational environment. Applications range from environmental monitoring and seismic studies to mobile target tracking, military surveillance, and scientific exploration. Wireless sensor networks are expected to dominate every aspect of our lives in the near future. This course presents the fundamentals regarding the hardware and software of wireless sensor networks.
Topics covered in this course include: Introduction to Wireless Sensor Networks, Applications, MAC Protocols for Sensor Networks, Routing protocols design challenges, Sensor networks database, Operating System requirements, Security issues in Wireless sensor networks, Case Studies.

Course title	Multimedia over IP Networks		
Course code	ITNT405	Credits	3
Course type	Core ☒	Required☐	Elective ☐
Prerequisites code	ITNT321, ITNT322		
Department	Computer Networks		

Course Description:
Advanced topics in technologies, protocols, standards and future trends of multimedia over computer networks are discussed in this course. Students taking this course will be aware of all details about standard protocols that are used to take care about multimedia transportation from end-to-end in Internet. Furthermore, an introduction to quality of service and traffic engineering is covered in this course.
Topics covered in this course include: review of standard TCP/IP protocol structure; standard multimedia protocols such as: session initiation protocol (SIP);session description protocol (SDP); real time transport protocol (RTP);real time control protocol (RTCP); real time streaming protocol (RTSP); resource reservation protocol (RSVP) and H.323 protocol; MPLS protocol and multimedia; study different multimedia applications such as VOIP; video conferencing and IPTV; introduction of traffic engineering and quality of service in IP networks; finally network analysis case study with OPNET tool.

مقترح تطوير

قسم هندسة البرمجيات

إعداد: لجنة قسم هندسة البرمجيات

2014/05/20

المقررات الدراسية التخصصية لقسم هندسة البرمجيات

Department Subjects				
SN	**Subject Code**	**Subject Name**	**Units**	**Prerequisites**
1	**ITSE311**	**Software Requirements Analysis**	**3**	ITGS213
2	**ITSE312**	**Advanced Database**	**3**	ITGS228
3	**ITSE321**	**Software Construction**	**3**	ITGS213, ITGS217, ITGS220, ITGS301
4	**ITSE322**	**Modern Programming Language (Advanced Java)**	**3**	ITGS211
5	**ITSE411**	**Software Design and Architecture**	**3**	ITSE321
6	**ITSE412**	**Advanced Internet programming**	**3**	ITGS226
7	**ITSE413**	**Human and Computer Interaction**	**3**	ITGS213
8	**ITSE414**	**Software Engineering Ethics**	**3**	ITSE311
9	**ITSE421**	**Software Quality Assurance and Testing**	**3**	ITSE321
10	**ITSE422**	**Multimedia**	**3**	ITSE413, ITGS226
11	**ITSE423**	**Visual Programing**	**3**	ITGS211
12	**ITSE424**	**Parallel and Distributed Systems Programming**	**3**	ITGS302, ITSE322
13	**ITSE500**	**BSc Project**	**4**	ITGS303

المواد الاختيارية بقسم هندسة البرمجيات

Electives				
SN	**Subject Code**	**Subject Name**	**Units**	**Prerequisites**
1	**ITSE301**	**Logic Programming**	**3**	ITGS211
2	**ITSE302**	**Data Mining**	**3**	ITGS301
3	**ITSE303**	**Modeling for Complex Systems**	**3**	ITGS217, ITMM211, ITSE301
4	**ITSE304**	**Mobile Applications Programming**	**3**	ITGS226, ITSE322
5	**ITSE305**	**Special Topics**	**3**	
6	**ITSE401**	**Computer Games Design and Implementation**	**3**	ITGS217, ITSE322, ITSE413
7	**ITSE402**	**Faculty Free Elective**	**3**	
8	**ITSE403**	**University Free Elective**	**3**	
9	**ITSE404**	**Software Reuse and Component-Based SE**	**3**	ITSE321

توزيع المواد على الفصول الدراسية لقسم هندسة البرمجيات

Semester	Subject Code	Subject Title
Year 1: First Semester	ITGS111	Introduction to Information Technology
	ITGS113	Problem Solving Techniques
	ITMM111	Mathematics 1
	ITPH111	Physics
	ITAR111	Arabic Language I
	ITEL111	English Language I
Year 1: Second Semester	ITGS122	Introduction to Programming
	ITGS124	System Analysis and Design
	ITGS126	Logic Circuits
	ITMM122	Mathematics 2
	ITAR122	Arabic Language II
	ITEL122	English Language II
Year 2: Third Semester	ITGS211	OO Programming
	ITGS213	Introduction to Software Engineering
	ITGS215	Introduction to Networking
	ITGS217	Discrete Structures
	ITGS219	Numerical Methods
	ITMM211	Statistics & Probability
Year 2: Forth Semester	ITGS220	Data Structures
	ITGS222	Foundations of IS
	ITGS224	Information Security
	ITGS226	Introduction to Internet Programming
	ITGS228	Introduction to Databases
	ITGS223	Computer Architecture

Semester	Subject Code	Subject Title
Year 3: Fifth Semester	ITGS301	Design and Analysis of Algorithms
	ITSE311	Software Requirements Analysis
	ITSE312	Advanced Database
	ITGS303	IT Project Management
	Elective 01	
	Elective 02	
Year 3: sixth Semester	ITGS302	Operating Systems
	ITGS304	Scientific Writing
	ITSE321	Software Construction
	ITSE322	Modern Programming Language (Advanced Java)
	Elective 03	
	Elective 04	
Year 4: Seventh Semester	ITSE411	Software Design and Architecture
	ITSE412	Advanced Internet programming
	ITSE413	Human and Computer Interaction
	ITSE414	Software Engineering Ethics
	Elective 05	
	ITSE500	BSc Project
Year 4: Eighth Semester	ITSE421	Software Quality Assurance and Testing
	ITSE422	Multimedia
	ITSE423	Visual Programing
	ITSE424	Parallel and Distributed Systems Programming
	ITSE500	BSc Project

وصف مواد التخصص بقسم هندسة البرمجيات

Course title	Software Requirements Analysis		
Course code	ITSE311	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS213		
Department	Software Engineering		
Course Description: This course aims at the study of methods, tools, notations, and validation techniques for the analysis and specification of software requirements. Covered topics include: Techniques for gathering requirements; representation Languages and Models; Analysis and validation techniques; Requirements in the context of system engineering; Specifying and measuring external qualities: performance, reliability, availability, safety, security, etc; Requirements documentation standards; Traceability; Human factors; Requirements in the context of agile processes; Requirements management; Handling requirements changes.			

Course title	Advanced Database		
Course code	ITSE312	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS228		
Department	Software Engineering		
Course Description: The course aims for the students to be able to develop scalable, distributed applications with SQL to meet organizational requirements. Contents of this subject: Data definition; Managing Tables with DDL; Creating schemas; Referencing schemas versus using the default schema; hiding schemas with synonyms; Building tables; Adding and enforcing constraints; Declaring variables and parameters; Creating and utilizing local variables; Passing input and output parameters; Calling built-in scalar functions; Converting data using CAST and CONVERT; Ordering data with ranking functions; Maintaining Data; Modifying data; Creating Views; Stored Procedures and Stored procedure compilation and execution; Auditing and implementing constraint on data by the means of Triggers; Handling errors by communicating problems to the.			

Course title	Software Construction			
Course code	ITSE321	Credits		3
Course type	Core ☐	Required ☒		Elective ☐
Prerequisites code	ITGS213	ITGS217	ITGS220	ITGS301
Department	Software Engineering			
Course Description: General principles and techniques for disciplined low-level software design. BNF and basic theory of grammars and parsing. Use of parser generators. Basics of language and protocol design. Formal languages. State-transition and table-based software design. Formal methods for software construction. Techniques for handling concurrency and inter-process communication. Techniques for designing numerical software. Tools for model-driven construction. Introduction to Middleware.				

Course title	Modern Programming Language (Advanced Java)		
Course code	ITSE322	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS211		
Department	Software Engineering		
Course Description: To enable the students to design and develop enterprise strength distributed and multitier applications – Using Java Technology.A continuation of advanced Java programming techniques such as network programming, advanced graphical functions, JDBC, Swing, JavaBeans, Servlets and JavaServer Pages will be introduced.			

Course title	Software Design and Architecture		
Course code	ITSE411	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITSE321		
Department	Software Engineering		
Course Description: This course offers an in-depth look at software design. Continuation of the study of design patterns, frameworks, and architectures. Survey of current middleware architectures. Design of distributed systems using middleware. Component based design. Measurement theory and appropriate use of metrics in design. Designing for qualities such as performance, safety, security, reusability, reliability, etc. Measuring internal qualities and complexity of software. Evaluation and evolution of designs. Basics of software evolution, reengineering, and reverse engineering.			

Course title	Advanced Internet programming		
Course code	ITSE412	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS226		
Department	Software Engineering		
Course Description: A second Internet programming course concentrating on advanced Internet application development. Creation of relatively sophisticated web pages and application that allow interactions between web page users and the web page as well as network programming, JDBC, XML processing are the main focus of the course. Different Internet programming language (JavaScript, jQuary, PHP) and tools will also be covered.			

Course title	Human and Computer Interaction		
Course code	ITSE413	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS213		
Department	Software Engineering		
Course Description: Students will learn the fundamental concepts of human-computer interaction and user centered design thinking, through working in teams on an interaction design project, supported by lectures, readings, and discussions. They will learn to evaluate and design usable and appropriate software based on psychological, social, and technical analysis. They will become familiar with the variety of design and evaluation methods used in interaction design, and will get experience with these methods in their project. Topics will include usability and affordances, direct manipulation, systematic design methods, user conceptual models and interface metaphors, design languages and genres, human cognitive models, physical ergonomics, information and interactivity structures, and design tools and environments.			

Course title	Software Engineering Ethics		
Course code	ITSE414	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITSE311		
Department	Software Engineering		
Course Description: The course gives an insight into the ethical problems important for professionals in Software Engineering and Computer Applications. It forms a framework in which professional and ethical issues can be analyzed, and builds up an awareness of various views of ethical issues and the ethical responsibilities of professionals. The topics include, among others: Fundamental moral theories of Engineering ethics; the social context of a profession; conflicts between loyalties to different principles such as safety and economy; precautionary principle and environmental impact; integrity; privacy; ownership; etc.			

Course title	Software Quality and Testing		
Course code	ITSE421	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITSE321		

Department	Software Engineering
Course Description: This course shows how to define software quality and how it is assessed through various testing techniques it is intended to acquaint the students with principles, techniques and best practices of software quality assurance concentrating on software testing and verification It will cover functional testing, structural testing, regression testing, test automation, specification based testing, code review.	

Course title	Multimedia		
Course code	ITSE422	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITSE413	ITGS226	
Department	Software Engineering		
Course Description: The course is a basic grounding in issue surrounding multimedia design, implementation and multimedia data. It enhances the student's view about graphics and images. The course will cover the following: digital audio, graphics, still images and videos, animation. Also it includes data compression and transmission of media, as well as software tools used for integrating digital media.			

Course title	Visual Programming		
Course code	ITSE423	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS211		
Department	Software Engineering		
Course Description: This course introduces visual programming, the design and implementation of programs that utilize a visual user-interface. Topics covered will include: use of Microsoft Visual Studio for designing the interface; the message/event driven programming model, , audio and visual programming concepts, and will provide the framework to explore artistic programming projects; logical structure of the program (e.g. separating interface from "business logic"); control containers (e.g. graphics, dialogs, forms); and controls (e.g. button, slider, edit box.) Programming will be done in Visual Studio, which the student should have installed and operational on the first day of class.			

Course title	Parallel and Distributed Systems Programming		
Course code	ITSE424	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS302	ITSE322	
Department	Software Engineering		
Course Description: The subject is to make the students able to design, and implement distributed software systems in Java using sockets, remote procedure call mechanisms, and JAVA RMI. It will cover: Process & thread management, Basic Process Model, Scheduling, Critical Sections and Synchronization, Mutual exclusion, Semaphores, Conditional variables, Monitors; Concurrency, Modeling concurrent activity starting with JAVA threads, Forms of communication, architectures, Means of communication (Shared memory, Direct communication between processes); Distributed Systems, Client-server model, Naming and binding, RPC General principles, Protection and Security; Java RMI.			

Course title	Logic Programming		
Course code	ITSE301	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS211		
Department	Software Engineering		
Course Description: The course provides an introduction to Logic Programming. Topics Include: the syntax and the semantics of Prolog; Prolog interpreter; problem solving in AI; Prolog database querying, parsing, meta-programming; List Processing; Controlling Backtracking; Definite Clause Grammars; Practical Applications; Semantic Web and Logic Programming.			

Course title	Data Mining		
Course code	ITSE302	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS301		
Department	Information Systems		
Course Description: This course will define the notion of Business Intelligence and its components. It will change the way students think about data and its role in business. The goal of the course is to examine how data mining technologies can be used to improve decision-making. The topics will be covered include, Introduction to data mining and data mining process (identify business problem, build mining database, prepare data for modelling, build and evaluate model); Predictive Modelling; Descriptive/ Unsupervised Data Mining; Data Mining for business applications; Data mining and electronic commerce, Data warehousing: concepts and techniques; Data Warehouse Architecture; Data Warehousing to improve decision-making in business.			

Course title	Modeling for Complex Systems		
Course code	ITSE303	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS217	ITMM211	ITSE301
Department	Software Engineering		
Course Description: The course introduces the student to computational techniques used for modeling and applications of complex real-world systems, and studies their temporal and spatial evolution. This course includes: complex systems; autonomous components; agent based modeling; stochastic simulation; species/activity modeling; use of system investigation tools.			

Course title	Mobile Applications Programming		
Course code	ITSE304	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITSE322	ITGS226	
Department	Software Engineering		
Course Description: This course is concerned with the development of applications on mobile and wireless computing platforms. Any mobile platform (Android, iOS, and Windows 8) could be used as a basis for teaching programming techniques and design patterns related to the development of standalone applications and mobile systems. Emphasis is placed on the processes, tools and frameworks required to develop applications for current and emerging mobile computing devices. Students will work at all stages of the software development life-cycle from inception through to implementation and testing. In doing so, students will be required to consider the impact of user characteristics, device capabilities, networking infrastructure and deployment environment, in order to develop software capable of meeting the requirements of stakeholders.			

Course title	Special Topics		
Course code	ITSE305	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code			
Department	Software Engineering		
Course Description: This course is a topic or a collection of topics selected be the department according to the current developments in technology, curriculum, and job market. .			

Course title	Computer Games Design and Implementation		
Course code	ITSE401	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS217	ITSE322	ITSE413
Department	Software Engineering		
Course Description: The course provides an introduction to the core concepts involved in designing and programming computer games. Subjects covered are: graphics; sprites, threads, sound; 2D platform games; 3D graphics; interaction and animation; lighting.			

Course title	Faculty Free Elective		
Course code	ITSE402	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code			
Department	Software Engineering		
Course Description: This course is a subject chosen by the student from amongst subjects are being thought by other department in the Faculty. .			

Course title	University Free Elective		
Course code	ITSE403	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code			
Department	Software Engineering		
Course Description: This course is a subject chosen by the student from amongst subjects are being thought by other Faculties in the University. .			

Course title	Software Reuse and Component-Based SE		
Course code	ITSE404	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITSE321		
Department	Software Engineering		
Course Description: The course aims at introducing the students to the methods and techniques for constructing large-scale software systems from preexisting components; Topics include: Market versus technology; Component standards; component definition; Components interfaces and re-entrance; Aspects of scale and granularity; Patterns, frameworks, architectures; Reusing design patterns; Common Object Request Broker Architecture (CORBA); Java Beans; Enterprise Java Beans (EJB); Component development; Component distribution, acquisition and assembly.			

الجـــزء الثـــاني

مقترحات الاقسام المستحدثة

جامعة طرابلس
كلية تقنية المعلومات

مقترح إنشاء

قسم تقنيات الانترنت

إعداد: لجنة قسم تقنيات الانترنت

2014 / 05 / 23

جدول المحتويات

1. مقدمة:

يهتم قسم برمجة نظم الانترنت بتأهيل و إعداد جيل جديد من مصممي ومطوري نظم المعلومات والبرامج لاستخدام التقنيات الحديثة في البرمجة، تطوير مواقع الانترنت، ومراكز المعلومات. هذا كله ياتي لتلبية احتياجات المؤسسات الليبية المتزايدة في هذا المجال في هذه المرحلة من بناء ليبيا واحتياجات سوق العمل.

عليـــــه تعتزم كلية تقنية المعلومات إفتتاح قسم برمجة نظم الانترنت وذلك في الفصل الدراسي القادم خريف 2015/2014.

لقد تم إعداد هذا المقترح بناءً على مقاييس الجودة أخذين بعين الإعتبار متطلبات الإعتماد المؤسسي والبرامجي محليا ودوليا. ولضمان اعداد خريجين ذو مهارات متقدمة لهم القدرة على المنافسة محليا وعالميا، لقد تم البحث والرجوع إلى مصادر وجمعيات متخصصة في وضع مناهج تخصص نظم برمجة الانترنت مثل(Association for Computing Machinery (ACM: و IEEE. والذي سينتج عنه تخريج مطوري نظم برمجة الانترنت بمؤهلات قياسية دولية، والذي بدوره سيمكنهم من مواصلة دراستهم العليا والدقيقة محليا وخارجيا والمنافسة للحصول علي أرقي الشهائد الدولية من الشركات العالمية المتخصصة مثل اوراكل وميكروسوفت.

2. الرؤية:

إعداد الطلاب إعدادا متخصصا في مجال برمجة الانترنت وفقا للمعايير الدولية

3. الرسالة:

تخريج مطوري برمجة نظم الانترنت بمؤهلات علمية متخصصة وبمهارات عالية من خلال تقديم برامج تعليمية متوافقة مع معايير الجودة الدولية والايفاء بمتطلبات سوق العمل المحلي والدولي.

4. الأهداف:

1. تقديم المناهج المتطورة لطلاب البكالوريوس وتطبيقها عمليا لاكسابهم المهارات اللازمة في مجال برمجة نظم الانترنت.
2. المساهمة في تزويد سوق العمل بالكوادر الوطنية بما يسد احتياجات الأعمال في تقنية المعلومات
3. اعداد الدراسات والبحوث و الاستشارات بالأساليب الحديثة في مجال نظم برمجة الانترنت.

5. متطلبات القسم الدراسية :

يوزع البرنامج الدراسي (الخطة الدراسية) لقسم برمجة نظم الانترنت على ثمانية فصول دراسية (أربع سنوات) على أن يتضمن برنامج الإجازة المتخصصة (البكالوريوس) عدد 135 وحدة دراسية يجب على الطالب إجتيازها للحصول على درجة البكالويوس في تخصص تقنيات الانترنت وبما يتفق والمادة (13) من لائحة نظام الدراسة والإمتحانات بكلية تقنية المعلومات.

- تقسم هذه الوحدات على النحو التالي:

  - متطلبات الجامعة: عدد (8) وحدات دراسية تشمل المقررات العامة بجامعة طرابلس.
  - متطلبات الكلية العامة : عدد (18) وحدة دراسية مع عدد (4) وحدات لمشروع تخرج الطالب
  - متطلبات الكلية التخصصية: عدد (54) وحدة دراسية.
  - متطلبات القسم التخصصية: عدد (36) وحدة دراسية.

الجداول التالية توضح توزيع هذه الوحدات على المتطلبات المذكورة، بالإضافة إلى المواد التمهيدية لكل مادة.

1.6 متطلبات الجامعة:

يستوجب على الطالب إجتياز عدد 4 مقررات جامعية، بعدد 2 وحدة دراسية لكل مقرر، مع ضرورة إجتياز المقررات التمهيدية إن وجدت كما هو موضح بالجدول التالي:

Prerequisite	Credits	Course Title	Course Title	Code
	2	Arabic Language I	لغة عربية 1	ITAR111
	2	English Language 1	لغة إنجليزية 1	ITEL111
ITAR111	2	Arabic Language II	لغة عربية 2	ITAR121
ITEL111	2	English Language II	لغة إنجليزية 2	ITEL121
	8			المجموع

2.6. متطلبات الكلية

1.2.6. متطلبات الكلية العامة (غير تخصصية للمرحلة العامة)

يستوجب على الطالب إجتياز عدد 6 مقررات جامعية إلزامية غير تخصصة، بحسب عدد الوحدات لكل مقرر، مع ضرورة إجتياز المقررات التمهيدية إن وجدت كما هو موضح بالجدول التالي:

Prerequisite	Credits	Course Title in English	Course Title in Arabic	Code
-	3	Mathematics 1	رياضة 1	ITMM111
-	3	Introduction to statistics and probability	مبادئ الاحصاء و الاحتمالات	ITST111
ITMM111	3	Mathematics 2	رياضة 2	ITMM121
	3	Physics (Electronic and Magnetic)	فيزياء (الكترونية ومغناطيسية)	ITPH111
ITMM121, ITGS122	3	Numerical Methods	الطرق العددية	ITGS219
ITEL121	3	Scientific Writing	كتابة تقارير (لغة انجليزية3)	ITGS304
	18			مجموع الوحدات

2.2.6. متطلبات الكلية التخصصية (تخصصية للمرحلة العامة):

يستوجب على الطالب إجتياز عدد 19 مقرر جامعي إلزامي تخصصي، بعدد 3 وحدات دراسية لكل مقرر،ويكون مشروع التخرج بعدد 4 وحدات دراسية مع ضرورة إجتياز المقررات التمهيدية إن وجدت كما موضح بالجدول التالي:

رمز المادة	اسم المادة (عربي)	إسم المادة (الانجليزية)	الوحدات	المقرر التمهيدي
ITGS111	مقدمة في تقنية المعلومات	Introduction to Information Technology	3	-
ITGS113	تقنيات حل المشاكل	Problem Solving Techniques	3	-
ITGS122	مقدمة في البرمجة	Introduction to Programming	3	ITGS113
ITGS124	تحليل و تصميم نظم	Systems Analysis and Design	3	ITGS113
ITGS126	الدوائر المنطقية	Logic Circuits	3	ITPH111
ITGS211	البرمجة الشيئية	Object Oriented Programming	3	ITGS122
ITGS213	مقدمة في هندسة البرمجيات	Introduction to Software Engineering	3	ITGS111
ITGS215	مقدمة في الشبكات	Introduction to Networking	3	ITGS111
ITGS217	التراكيب المنفصلة	Discrete Structures	3	ITMM122
ITGS220	تراكيب بيانات	Data Structures	3	ITGS122
ITGS222	أساسيات نظم المعلومات	Foundations of Information Systems	3	ITGS111
ITGS223	معمارية الحاسوب	Computer Architecture	3	ITGS126
ITGS224	أمن المعلومات	Information Security	3	ITGS111
ITGS226	مقدمة في برمجة الانترنت	Introduction to Internet Programming	3	ITGS122
ITGS228	مقدمة في قواعد البيانات	Introduction to Databases	3	ITGS217
ITGS301	تصميم و تحليل الخورزميات	Design and Analysis of Algorithms	3	ITGS220
ITGS302	نظم تشغيل	Operating Systems	3	ITGS223
ITGS303	إدارة مشاريع	Project Management	3	ITGS213
ITWT500	المشروع	BSc. Project	4	ITGS303
مجموع الوحدات		54		

3.6. متطلبات القسم:

يشترط لتخصص الطالب في القسم أن يجتاز بنجاح مادة " أساسيات نظم المعلومات " و يشمل متطلبات القسم المقررات التخصصية والإختيارية التالية:

1.3.6. مقررات القسم التخصصية:

يستوجب على الطالب إجتياز عدد 12 مقرر كمتطلبات القسم التخصصية، بعدد 3 وحدات للمقررات النظرية ، كما هو موضح بالجدول التالي:

رمز المادة	اسم المادة (عربي)	إسم المادة (الانجليزية)	الوحدات	المقرر التمهيدي
ITWT311	برمجة الانترنت المتقدمة	Advanced Internet Programming	3	ITGS226
ITWT313	قواعد البيانات II	Database II	3	ITGS228
ITWT315	تفاعل الانسان مع الحاسوب	Human computer Interaction	3	ITGS213
ITWT317	اجراءات ولوائح الامان	Security Policies and Procedures	3	ITGS224
ITWT320	برمجة الخادم والعميل	Client-Server programming	3	ITWT311
ITWT322	تصميم واجهات المستخدم	User interface design	3	ITWT315
ITWT324	تطوير انظمة الصوت والصورة	Multimedia System development	3	ITWT315, ITGS226
ITWT411	خدمات الانترنت	WEB services	3	ITWT320
ITWT413	تطوير تطبيقات الانترنت	Web application development	3	ITWT311
ITWT415	نظم التطوير المتكاملة	Development Environment Content Management system	3	ITWT311
ITWT420	القرصنة الاخلاقية ودفاع الشبكات	Ethical Hacking and Network Defence	3	ITWT317
ITWT422	تطوير تطبيقات الانترنت المتنقلة	Application development for mobile devices	3	ITWT311
			36	

2.3.6. مواد تخصصية إختيارية:

من ضمن المقررات الدراسية الذي ينبغي على الطالب دراستها هي المواد التخصصية الاختيارية للقسم فعلى الطالب دراسة (5) مواد دراسية أختيارية من أصل (9) مواد كما هو موضح فى الجداول التالية ، كما أن القسم يقترح على الطالب بدراسة المواد المدرجة في الجدول في الفصول المذكورة ، كما أن الطالب غير ملزم بهذه المقترحات و يمكن اختيار اى 5 مواد من الجدول التالي:-

رمز المادة	اسم المادة (عربي)	إسم المادة (الانجليزية)	الوحدات	الممهد
ITWT301	التنقيب في البيانات	Data mining	3	ITGS211
ITWT302	إسترجاع المعلومات	Information retrieval	3	ITGS226
ITWT303	مقدمة في رسوم الحاسب الألي	Introduction to 2D computer graphics	3	ITGS211
ITWT304	التجارة الالكترونية	e-commerce	3	ITGS111
ITWT305	تطوير الالعاب	Game development	3	ITWT311
ITWT306	نقل الصوت والصورة على الشبكات	Multimedia over IP networks	3	ITWT324
ITWT307	الحوسبة السحابية	Cloud computing	3	ITWT311
ITWT308	معالجة الصور	Image processing	3	ITGS211
ITWT309	الشبكات المترامية	Wide area network	3	ITGS215
			27	

7. توزيع المواد الدراسية على الفصول الدراسية

الجدول التالي يوضح توزيع المواد الدراسية على الفصول الدراسية وأسبقياتها، بالإضافة إلى المواد التمهيدية لكل مادة.

Semester	Course#	Course Title
Year 1: First Semester	ITGS111	Introduction to Information Technology
	ITGS113	Problem Solving Techniques
	ITMM111	Mathematics 1
	ITPH111	Physics
	ITAR111	Arabic Language I
	ITEL111	English Language I
Year 1: Second Semester	ITGS122	Introduction to Programming
	ITGS124	System Analysis and Design
	ITGS126	Logic Circuits
	ITMM122	Mathematics 2
	ITAR122	Arabic Language II
	ITEL122	English Language II
Year 2: Third Semester	ITGS211	OO Programming
	ITGS213	Introduction to Software Engineering
	ITGS215	Introduction to Networking
	ITGS217	Discrete Structures
	ITGS219	Numerical Methods
	ITMM211	Statistics & Probability
Year 2: Forth Semester	ITGS220	Data Structures
	ITGS222	Foundations of IS
	ITGS224	Information Security
	ITGS226	Introduction to Internet Programming
	ITGS228	Introduction to Databases
	ITGS223	Computer Architecture

Semester	Course#	Course Title
Year 3: Fifth Semester	ITGS301	Design and Analysis of Algorithms
	ITWT317	Security Policies and Procedures
	ITWT313	Database II
	ITGS302	Operating Systems
	ITWT311	Advanced Internet Programming
	ITWT315	Human computer Interaction
Year 3: sixth Semester	ITGS303	IT Project Management
	ITWT320	Client-Server programming
	ITWT322	User interface design
	ITWT440	Ethical Hacking and Network Defense
	ITWT413	Web application development
	Elective 01	
Year 4: Seventh Semester	ITGS304	Scientific Writing
	ITWT324	Multimedia System development
	ITWT415	Development Environment Content Management system
	ITW411	WEB Services
	Elective 02	
	Elective 03	
	ITWT500	BSc Project
Year 4: Eighth Semester	ITWT422	Application development for mobile devices
	Elective 04	
	Elective 05	
	ITWT500	BSc Project

8. توصيف المواد

1.8. المواد التخصصية الإلزامية:

Course title	Advanced Internet programming		
Course code	ITWT311	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITGS226		
Department	Web Technologies		
Course Description: A second Internet programming course concentrating on advanced Internet application development. Creation of relatively sophisticated web pages and application that allow interactions between web page users and the web page as well as network programming, JDBC, XML processing are the main focus of the course. Different Internet programming language (JavaScript, jQuary, PHP) and tools will also be covered.			

Course title	Advanced Database		
Course code	ITWT313	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITGS228		
Department	Web Technologies		
Course Description: The course aims for the students to be able to develop scalable, distributed applications with SQL to meet organizational requirements. Contents of this subject: Data definition; Managing Tables with DDL; Creating schemas; Referencing schemas versus using the default schema; hiding schemas with synonyms; Building tables; Adding and enforcing constraints; Declaring variables and parameters; Creating and utilizing local variables; Passing input and output parameters; Calling built-in scalar functions; Converting data using CAST and CONVERT; Ordering data with ranking functions; Maintaining Data; Modifying data; Creating Views; Stored Procedures and Stored procedure compilation and execution; Auditing and implementing constraint on data by the means of Triggers; Handling errors by communicating problems to the.			

Course title	Introduction to Human-Computer Interaction		
Course code	ITWT315	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITGS213		
Department	Web Technologies		
Course Description: This course provides an introduction to the field of human-computer interaction (HCI), an interdisciplinary field that integrates cognitive psychology, design, computer science and others. Examining the human factors associated with information systems provides the students with knowledge to understand what influences usability and acceptance of IS. This course will examine human performance, components of technology, methods and techniques used in design and evaluation of IS. Societal impacts of HCI such as accessibility will also be discussed. User-centered design methods will be introduced and evaluated. This course will also introduce students to the contemporary technologies used in empirical evaluation methods.			

Course title	Security Policies and Procedures		
Course code	ITWT317	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITGS224		

Department	Web Technologies
Course Description: Topics covered in this course include: Threats to Enterprise Security; An Overview of Enterprise I.T. Threat Responses; Common Enterprise Security Issues; Specialized Enterprise Security Issues; Security Policies; Security Standards and Procedures; Security in System Development; Operational Security Management; Introduction to Business Continuity and Disaster Recovery; Preparing for I.T. Continuity; Managing Disaster Recovery; Managing Quality and Security Risk in System Development.	

Course title	Client-Server Programming		
Course code	ITWT320	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT311		
Department	Web Technologies		
Course Description: The aim of this course is to give the students network programming concepts using a modern programming platform. Topics covered include: The language's network classes, the Winsock interface, DNS resolution, the core topics of the network layer - to make sockets connections via TCP, and "connectionless" connections via UDP, asynchronous socket programming, multithreading, and multicasting, providing application layer programming examples - use SNMP to manage network devices, SMTP to communicate with remote mail servers, and HTTP to Web-enable your applications. A practical part includes writing Client-side scripts and server-side programs.			

Course title	User interface design		
Course code	ITWT322	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT315		
Department	Web Technologies		
Course Description: Topics include: Human-centered software development: Approaches, characteristics, and overview of process, functionality and usability: task analysis, interviews, surveys, Specifying interaction and presentation, Prototyping techniques and tools Graphical user-interface design: Choosing interaction styles and interaction techniques, HCI aspects of common widgets, HCI aspects of screen design: layout, color, fonts, labeling, Handling human failure, Beyond simple screen design: visualization, representation, metaphor, Multi-modal interaction: graphics, sound, and haptics, 3D interaction and virtual reality Graphical user-interface programming: UIMS, dialogue independence and levels of analysis, Widget classes, Event management and user interaction, Geometry management, GUI builders and UI programming environments, Cross-platform design HCI aspects of multimedia systems: Categorization and architectures of information: hierarchies, hypermedia, Information retrieval and human performance (Web search, Usability of database query languages, Graphics, Sound), HCI design of multimedia information systems, Speech recognition and natural language processing, Information appliances and mobile computing			

Course title	Multimedia System development		
Course code	ITWT324	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT315,	ITGS226	

Department	Web Technologies
Course Description: This course covers: introduction to multimedia systems; definition of terms and concepts related to multimedia; trends in the development and the use of multimedia. Tools, techniques, and guidelines facilitating the planning, design, production, and implementation of multimedia products. Practical part: Students need to author a multimedia product with the some of the following programs: Macromedia Director or Authorware, Toolbook, Microsoft PowerPoint, Dreamweaver. In addition the student will need access to editing programs for graphics, sounds, video, and animation.	

Course title	Web Services		
Course code	ITWT411	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT320		
Department	Web Technologies		
Course Description: Topics covered in this course include: Apache, TCP/IP, How Does Apache Use TCP/IP; Apache's Flags; Block Directives; Virtual Hosts; HTTP Response Headers; Common Gateway Interface (CGI); Writing and Executing Scripts; Script Directives; Debugging Scripts; Setting Environment Variables; suEXEC on Unix; Handlers; Actions; Authentication; Authentication Protocol Authentication Directives; Passwords Under Unix; Order, Allow, and Deny; Digest Authentication; Anonymous Access; Automatic User Information; Using .htaccess Files; Overrides; MIME, Content and Language Negotiation; Indexing ; Redirection; Proxy Server, Proxy Directives, Caching; Server-Side Includes: Server Status, Server Info, Logging, Authentication; Blocking Access; Counters; Faster CGI Programs; FrontPage from Microsoft; Languages and Internationalization; Server-Side Scripting; Throttling Connections; URL Rewriting; Miscellaneous: MIME Magic, DSO; Security: Apache-SSL, The Apache API, Writing Apache Modules. Laboratory Projects: Students implement a Unix operating system and provide user services, internetwork services and application services to serve external “client” requests.			

Course title	Web application development		
Course code	ITWT413	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT311		
Department	Web Technologies		
Course Description: This course will introduce web application concepts using both Django/Python and J2EEbased technologies, and you will be able to generalize these concepts to other web application technologies and tools. Covered topics include: Web data protocols. HTML, CSS, and Bootstrap. JavaScript. jQuery. Ajax. Web frameworks and design patterns. Cookies. Sessions. Many Django and J2EE applied concepts. Databases and transaction management. ORM tools. Web security. Concurrency. View templating. Web scalability and performance. Cloud services. Principles of UI design.			

Course title	Development Environment Content Management system		
Course code	ITWT415	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT311		

Department	Web Technologies
Course Description: This course explores the use of the three most popular open source web-based content management systems—WordPress, Joomla, and Drupal—to create dynamic and flexible websites and landing pages. Participants explore the fundamentals of planning dynamic websites, CMS database management, developing CSS-controlled site templates, and creating database-driven websites through the planning and creation of their own topic-based sites.	

Course title	Ethical Hacking and Network Defense		
Course code	ITWT420	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT317		
Department	Web Technologies		
Course Description: Topics covered in this course include: introduction to Ethical Hacking; Hacking Laws; Footprinting; Google Hacking; Scanning; Enumeration; System Hacking; Trojans and Backdoors; Viruses and Worms; Phishing Phishing; Session Hijacking; Hacking Web Servers; Network Devices & Attacks; Denial of Service Attacks; Hacking Wireless Networks; Hacking Laws and Legal and Ethical Considerations.			

Course title	Application development for mobile devices		
Course code	ITWT422	Credits	3
Course type	Core ☐	Required☒	Elective ☐
Prerequisites code	ITWT311		
Department	Web Technologies		
Course Description: This course will introduce students to application development for mobile devices. The course focuses on using the SAMSUNG LAB as the development platform, but the concepts covered in the course are platform agnostic. As such, students will be introduced to the Objective-C programming language, the XCode programming environment, and the iPhone SDK and APIs. Topics include: User-interaction design and requirements design, Graphical User Interfaces and Event-Driven Programming, Advanced Object-Oriented Programming, Robust design and programming for user constraints (application interruption, application responsiveness, partial user engagement), Robust design and programming for device constraints (power consumption, screen size, network connectivity, memory limitations), Data distribution: distribution types, basic parsing, distribution security. Location awareness, messaging, and other connections between the device and the outside world.			

2.8. توصيف المواد التخصصية الإختيارية:

Course title	Data mining		
Course code	ITWT301	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITGS211		
Department	Web Technologies		
Course Description: This course covers: basic concepts concerning knowledge discovery in data, relation of knowledge discovery and data mining. Data sources for knowledge discovery. Principles and techniques of data preprocessing for mining. Systems for knowledge discovery in data, data mining query languages. Data mining techniques association rules, classification and prediction, clustering. Mining unconventional data - data streams, time series and sequences, graphs, spatial and spatio-temporal data, multimedia. Text and web mining. Working-out a data mining project by means of an available data mining tool.			

Course title	Information retrieval		
Course code	ITWT302	Credits	3
Course type	Core ☐	Required☒	Elective ☒
Prerequisites code	ITGS226		
Department	Web Technologies		
Course Description: Information Retrieval provides a strong grounding in the fundamentals of organizing on-line information, multimedia warehouses, Web search/crawling and digital libraries. Topics include: Introduction to Information Retrieval , Boolean Retrieval, Dictionaries and Tolerant Retrieval, Index Construction, Dynamic Index Construction, Index Compression, The Vector Space Model, Scoring in the Vector Space Model, Information Retrieval Evaluation, Web Search, Web Crawling, Link Analysis, Flat Clustering, Hierarchical Clustering, Relevance Feedback, Query Expansion, New Research in Information Retrieval, Student Project.			

Course title	Introduction to 2D computer graphics		
Course code	ITWT303	Credits	3
Course type	Core ☐	Required☒	Elective ☒
Prerequisites code	ITGS211		
Department	Web Technologies		
This course covers: introduction to OpenGL, basics of rendering, drawing of graphics primitives, their features, camera settings, materials and lighting, textures, MIP mapping, filtration, rendering, textures (generation, procedural textures, special textures), volume data rendering, ray tracing advanced methods, radiation methods, morphing - 2D raster and 2D vector, global visibility, virtual reality, simulation and visualization of particle systems, free deformation, soft tissue animation, articulated structures animation.			

Course title	e-commerce		
Course code	ITWT304	Credits	3
Course type	Core ☐	Required☐	Elective ☒

Prerequisites code	ITGS111		
Department	Web Technologies		
Course Description: The course introduces modern management techniques that are used for the marketing, selling, and distribution of goods and services through the Internet. Topics include: E-business Strategy, Business Models in the new world, Cyber-services, E-business relationships, E-business technology, E-Marketing and e-payment, Antecedents and barriers to e-commerce, Business Process Management, Case studies with LAB work.			

Course title	Game development		
Course code	ITWT305	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITWT311		
Department	Web Technologies		
Course Description: This course covers: the nature of games engines (as an integrated development environment) and their purpose. Hardware support including use of threading; performance issues; input devices. Typical components including 3D rendering, and support for real-time graphics and interaction; also physics simulation, collision detection, sound, artificial intelligence; terrain rendering			

Course title	Multimedia over IP networks		
Course code	ITWT306	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITWT324		
Department	Web Technologies		
Topics covered in this course include: review of standard TCP/IP protocol structure; standard multimedia protocols such as: session initiation protocol (SIP);session description protocol (SDP); real time transport protocol (RTP);real time control protocol (RTCP); real time streaming protocol (RTSP); resource reservation protocol (RSVP) and H.323 protocol; MPLS protocol and multimedia; study different multimedia applications such as VOIP; video conferencing and IPTV; introduction of traffic engineering and quality of service in IP networks; finally network analysis case study with OPNET tool.			

Course title	Cloud computing		
Course code	ITWT307	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITWT311		
Department	Web Technologies		
Course Description: This course covers: Cloud Computing definition and characteristics; Infrastructure as a Service (IaaS), Platform as a Service (PaaS); Software as a Service (SaaS); Business Process as a Service (BPaaS); Cloud Security; Enterprise Cloud-Based High Performance Computing (HPC) Applications; Case studies.			

Course title	Image processing		
Course code	ITWT308	Credits	3

Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITGS211		
Department	Web Technologies		
Course Description: This course covers: introduction to image processing, image acquiring, point and discrete image transforms, linear image filtering, image distortions, types of noise, optimal image filtering, non-linear image filtering, watermarks, edge detection, segmentation, motion analysis, loseless and lossy image compression techniques.			

Course title	Wide area network		
Course code	ITWT309	Credits	3
Course type	Core ☐	Required☐	Elective ☒
Prerequisites code	ITGS215		
Department	Web Technologies		
Course Description: Topics covered in this course include: common Wide Area Networking (WAN) technologies and devices, WAN design including core, distribution, and access layers, traffic patterns, server placement, and router configuration, point-to-point) (PPP), Integrated Services Digital Network (ISDN), Frame Relay, Asynchronous Transfer Mode (ATM), X.25 and MPLS technology. It covers also the functions and operations of switching technologies.			

9. الإحتياجات المعملية:

تملك كلية تقنية المعلومات الموارد المعملية الكافية لتغطية الجانب العملي للتخصص، حيث ان القسم سيستفيد من المعامل الحديثة للكلية والتي ستدخل حيز العمل بالتزامن مع إقتتاح القسم.

جامعة طرابلس
كلية تقنية المعلومات

مقترح إنشاء

قسم الحوسبة المحمولة

إعداد: لجنة إنشاء قسم الحوسبة المحمولة

2014/05/17

المحتويات

قسم الحوسبة المحمولة

1. مقدمة:

الحوسبة المحمولة شهدت نموا بشكل كبير في السنوات الأخيرة.وكانت الجوانب الرئيسية لهذا النمو الإبتكارات الجديدة في تقنية الشبكات ونظم التشغيل و إدارة قواعد البيانات للأجهزة المحمولة و أجهزة المساعد الشخصي. و سيمكن هذا القسم للطلاب الراغبين في أن يكونوا في طليعة الدارسيين للابتكارات التقنية في مجال الحوسبة المحمولة. عليه فأن مقررات القسم مصممة بعناية لتزود الدارسيين بالمعارف والمهارات التقنية والنظرية للجوانب الثلاثة للحوسبة المحمولة (الاتصالات، الأجهزة ، البرمجيات).
تعتمد مقررات التخصص في قسم الحوسبة المحمولة كثيرا على مقررات الرياضيات بالإضافة إلى مقررات الحاسب الالي خصوصاً مهارة البرمجة التي درسها الطلاب في المرحلة العامة بكلية تقنية المعلومات.
ويتميز خريج تقنية المعلومات المتخصص في الحوسبة المحمولة بإمكانية العمل في المجالات الآتية: تصمم وتطوير برمجيات المتنقلة واخصائي تطوير التجارة الالكترونية وخدمات الدعم الفني وتصميم منظومات تتفاعل مع السحابة والعمل في قطاع الاتصالات المتنقلة واللاسلكية . بالإضافة لفرص مواصلة الخريجيين للدراسا العليا في مجال الحوسبة المحمولة للمؤهلين تأهيلا مناسبا.

2. الرؤية:

بناء بيئة بحثية وتعليمية قوية لتشكيل الجيل القادم من خريجي تقنية المعلومات المتميزين في مجال الحوسبة المحمولة.

3. الرسالة:

بناء قاعدة متينة من الخبرات والكفاءات الوطنية الفاعلة وتغطية إحتياجات سوق العمل من المتخصصين في مجال الحوسبة المحمولة.

4. الأهداف:

هذا القسم يهدف إلى توفير:

- تجربة تعليمية متميزة للطلاب في مجال الحوسبة المحمولة من خلال تحقيق التوازن بين المعرفة النظرية والمهارات العملية. وإعداد الطلاب للدراسات العليا في مجال الحوسبة المحمولة.
- المعرفة والمهارات التقنية اللازمة لخريجي القسم لتمكينهم من نقل المؤسسات الليبية لعصر الحوسبة المحمولة.
- المعرفة اللازمة للطلاب لتطوير وصيانة التطبيقات المتنقلة.
- معامل مجهزة بمجموعة متنوعة من التقنيات المتوافقة مع المعايير الدولية بما في ذلك الأجهزة المحمولة المتنوعة وبيئة تطوير متكاملة ومحاكاة والشاشات وأدوات الشبكات اللاسلكية.

- فهم المعماريات البنية التحتية للشبكات والاتصالات المحمولة للأنظمة المحمولة.
- مناخ علمي للباحثين لإجراء البحوث والدراسات العلمية النظرية والعملية في مجال الحوسبة المحمولة.

5. مهام ومسئوليات متخصصي الحوسبة المحمولة:

من المهام والمسؤوليات المنوطه لمتخصصي الحوسبة المحمولة على سبيل الذكر ولا الحصر:

- القدرة على البرمجة الشيئية باستخدام عدة لغات.
- القدرة على برمجة التطبيقات المتنقلة (المحمولة) داخل بيئة تطوير واحدة أو أكثر من أنظمة التشغيل المتنقلة.
- تنفيذ واجهات المستخدملدعم وظائف الأجهزة المتنقلة.
- الالمام بالمصطلحات والمفاهيم وأفضل الممارسات لبرمجة التطبيقات المتنقلة.
- القدرة على نقل والتكيف تطبيقات الويب الحالية إلى الأجهزة المحمولة الرائدة.
- العمل بشكل وثيق مع الإدارات الأخرى لتبادل الأفكار وتطوير استخدامات التطبيقات المتنقلة القائمة و الجديدة كجزء من البنية التحتية للتجارة المتنقلة.
- الربط بين التطبيقات المتنقلة والخوادم الجديدة أو القائمة وعن طريق السحابة.
- التعامل مع المنتجوالتصميم والهندسة والعمليات لتحديد متطلبات واضحة لإنجاز تطبيقات المتنقلة على شبكة الإنترنت.

6. الخطة الدراسية :

يقوم القسم بتدريس مقررات الحوسبة المحمولة ومقررات المرحلة العامة بمجموع 135 وحدة دراسية موزعة على أربع سنوات حسب الخطة الدراسية الموضوعة في لائحة نظام الدراسة والإمتحانات بكلية تقنية المعلومات.

1. **مقررات المرحلة العامة**: تتكون مقررات المرحلة العامة من التالي:

- 8 وحدات دراسية متطلبات الجامعة كما هو موضحة بالجدول التالي.

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITAR 111	لغةعربية 1	Arabic Language I	2	-
ITEL 111	لغةإنجليزية 1	English Language 1	2	-
ITAR 121	لغةعربية 2	Arabic Language II	2	ITAR 111
ITEL 121	لغةإنجليزية 2	English Language II	2	ITEL 111
مجموع الوحدات	8			

- 18 وحدة دراسية متطلبات الكلية العامة موضحة بالجدول التالي.

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITMM 111	رياضة 1	Mathematics 1	3	-
ITST 111	مبادئ الاحصاء والاحتمالات	Fundamentals of statistics and Probability	3	-
ITMM 121	رياضة 2	Mathematics 2	3	ITMM111
ITPH 111	فيزياء (الكترونية ومغناطيسية)	Physics (Electronic and Magnetic)	3	-
ITGS219	الطرق العددية	Numerical Methods	3	ITMM121, ITGS122
ITGS304	كتابة تقارير (لغة انجليزية3)	Scientific Writing	3	ITEL121
مجموع الوحدات			18	

- 54 وحدة دراسية متطلبات الكلية التخصصية بالجدول التالي.

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITGS111	مقدمة في تقنية المعلومات	Introduction to Information Technology	3	-
ITGS113	تقنيات حل المشاكل	Problem Solving Techniques	3	-
ITGS122	مقدمة في البرمجة	Introduction to Programming	3	ITGS113
ITGS124	تحليل وتصميم نظم	Systems Analysis and Design	3	ITGS113
ITGS126	الدوائر المنطقية	Logic Circuits	3	ITPH 111
ITGS211	البرمجة الشيئية	Object Oriented Programming	3	ITGS122
ITGS213	مقدمة في هندسة البرمجيات	Introduction to Software Engineering	3	ITGS111
ITGS215	مقدمة في الشبكات	Introduction to Networking	3	ITGS111
ITGS217	التراكيب المنفصلة	Discrete Structures	3	ITMM 122
ITGS220	هياكل البيانات	Data Structures	3	ITGS122
ITGS222	أساسيات نظم المعلومات	Foundations of Information Systems	3	ITGS111
ITGS223	معمارية الحاسوب	Computer Architecture	3	ITGS126
ITGS224	أمن المعلومات	Information Security	3	ITGS111
ITGS226	مقدمة في برمجة الانترنت	Introduction to Internet Programming	3	ITGS122
ITGS228	مقدمة في قواعد البيانات	Database Management System	3	ITGS217
ITGS301	تصميم وتحليل الخوارزميات	Design and Analysis of Algorithms	3	ITGS220
ITGS302	نظم التشغيل	Operating Systems	3	ITGS223
ITGS303	إدارة مشاريع	Project Management	3	ITGS213
مجموع الوحدات		54		

2. مقررات القسم التخصصية: يدرس طلبة قسم الحوسبة المحمولة (55) وحدة دراسية مابين مقررات متطلبات القسم ومقررات إختيارية على النحو التالي:

- 40 وحدة دراسية متطلبات القسم الإلزامية التخصصية بالجدول التالي:

الجدول التالي يوضح مقررات متطلبات القسم:

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITMC311	تطبيقات المتنقلة	Mobile Applications	3 *	ITGS211
ITMC312	شبكات المنطقة الشخصية	Personal Area Networks	3	ITGS215
ITMC313	نظم التشغيل للأجهزة المتنقلة	Mobile Operating Systems	3 *	ITGS236
ITMC321	تصميم التفاعل المتنقلة	Mobile Interaction Design	3 *	ITMC311
ITMC322	قواعدالبيانات المتنقلة وغير المتجانسة	Heterogeneous and Mobile Databases	3 *	ITGS217
ITMC323	تطوير التطبيقات باستخدام لغة الجافا مي	Application Development with Java ME	3 *	ITMC311
ITMC 411	الأمن في الحوسبة المحمولة	Security in mobile computing	3	ITMC313 &ITMC312
ITMC 412	الشبكات الاسلكية والمتنقلة	Principle of Wireless & Mobile Networks	3	ITMC312
ITMC413	الشبكة الاجتماعية	Social Networking	3 *	ITMC 323
ITMC421	أساسيات الحوسبة في كل مكان	Fundamentals ubiquitous computing	3	ITMC313 ITMC312
ITMC422	الحوسبة السحابية وتطبيقات المتنقلة	Cloud Computing and Mobile Applications	3 *	ITMC323
ITMC423	الوسائط المتعددة المتنقلة	Mobile Multimedia	3 *	ITMC413
ITMC 500	مشروع التخرج	BSc. Project	4	ITGS303
مجموع الوحدات		40		

ملاحظات:

- (*)المقرر يتطلب معمل.
- 3 وحدات دراسية تعادل3 ساعات تدريسية للمقرر النظري و4 ساعات تدريسية للمقرر الذي يتطلب معمل.
- مشروع التخرج يعادل 4 وحدات دراسية.

- على الطالب أن يختار 5 مقررات من بين مقررات التخصص الإختيارية الموضحة بالجدول التالي:

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITMC 316	معالج الميكر أي أر إم	ARM microprocessor	3	ITGS223
ITMC 317	نماذج البرمجة	Programming Paradigms	3	ITGS211
ITMC 318	اختيار الكلية الحر	Faculty Free Elective	3	-
ITMC 326	التجارة المتنقلة	Mobile Commerce	3	ITMC 311
ITMC 327	مواضيع في إنشاء المترجمات	Topics in compilers construction	3	ITGS217 ITGS236
ITMC 328	مواضيع خاصة	Special Topics	3	-
ITMC 416	رسومات ثلاثية الأبعاد المتنقلة	Mobile 3D Graphics	3	ITMC323
ITMC 417	الحوسبة المتوازية والموزعة	Parallel and Distributed Computing	3	ITMC323
ITMC 426	تطوير الالعاب المتنقلة	Mobile Game Developments	3	ITMC412
ITMC 427	اختيار الكلية الحر	Faculty Free Elective	3	-
ITMC 428	اختيار الجامعة الحر	University Free Elective	3	-
مجموع الوحدات		**15**		

3. توزيع مقررات الحوسبة المحمولة ومقررات المرحلة العامة على المدة الدراسية موضح بالجداول التالية:

السنة الأولى (الفصل الأول)

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITGS111	مقدمة في تقنية المعلومات	Introduction to Information Technology	3	-
ITGS113	تقنيات حل المشكلات	Problem Solving	3	-
ITMM 111	رياضة I	Math 1	3	-
ITPH 111	فيزياء (كهربائية ومغناطسية)	Physics (Electronic & magnetic)	3	-
ITAR 111	لغة عربية 1	Arabic Language 1	3	-
ITEL 111	لغة إنجليزية 1	English Language 1	3	-

السنة الأولى (الفصل الثاني)

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITGS122	مقدمة في البرمجة	Introduction to Programming	3	ITGS113
ITGS124	تحليل وتصميم نظم	System Analysis and Design	3	ITGS113
ITGS126	الدوائر المنطقية	Logic Circuits	3	ITPH111
ITMM 122	رياضة 2	Math 2	3	ITMM111
ITAR 122	لغة عربية 2	Arabic Languages 2	3	ITAR111
ITEL 122	لغة إنجليزية 2	English Language 2	3	ITEL111

السنة الثانية (الفصل الأول)

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITGS211	البرمجة الشيئية	Object Oriented Programming	3	ITGS122
ITGS213	مقدمة هندسة البرمجيات	Introduction to Software Engineering	3	ITGS111
ITGS215	مقدمة في شبكات	Introduction to Networks	3	ITGS111
ITGS217	التراكيب المنفصلة	Discrete Structures	3	ITMM122
ITMM 211	الطرق العددية	Numerical Methods	3	ITMM122 & ITGS122
ITST 211	أحصائيات و إحتمالات	Statistics and probabilities	3	ITMM111
ITGS304	لغةانجليزية3 (كتابة تقارير)	Scientific Writing	3	ITEL122

السنة الثانية (الفصل الثاني)

رقم المقرر	أسم المقرر- عربي	أسم المقرر- إنجليزي	عدد الوحدات	مقررات التمهيدية
ITGS220	هياكل البيانات	Data Structures	3	ITGS122
ITGS222	أساسيات نظم المعلومات	Foundations of Information Systems	3	ITGS111
ITGS223	معمارية الحاسب	Computer Architecture	3	ITGS126
ITGS224	أمن المعلومات	Information Security	3	ITGS111
ITGS226	مقدمة في برمجة الانترنت	Introduction to Internet Programming	3	ITGS122
ITGS228	مقدمة في قواعد البيانات	Introduction to Databases	3	ITGS217

السنة الثالثة (الفصل الأول)			
رقم المقرر	**إنجليزي -أسم المقرر**	**مقررات الممهدة**	**عدد الوحدات**
ITGS301	Analysis and Design Algorithms	ITGS220	3
ITMC311	Mobile Applications	ITGS211	3
ITMC312	Personal Area Networks	ITGS215	3
ITGS302	Operating System	ITGS223	3
ITMC316	Programming Paradigms	ITGS230	3

السنة الثالثة (الفصل الثاني)			
رقم المقرر	إنجليزي -أسم المقرر	مقررات الممهدة	عدد الوحدات
ITMC313	Mobile Operating Systems	ITGS230 ITGS235	3
ITMC321	Mobile Interaction Design	ITMC311	3
ITMC322	Heterogeneous and Mobile Databases	ITGS217	3
ITMC323	Application Development with Java ME	ITMC311	3
ITGS303	IT Project management	ITGS213	3
ITMC327	Topics in compilers construction	ITGS217 ITGS301	3

السنةالرابعة (الفصل الأول)			
رقم المقرر	إنجليزي -أسم المقرر	مقررات الممهدة	عدد الوحدات
ITMC 416	Mobile 3D Graphics	ITMC323	3
ITMC 411	Security in mobile computing	ITMC313 ITMC312	3
ITMC 412	Principle of Wireless & Mobile Networks	ITMC312	3
ITMC413	Social Networking	ITMC 323	3
ITMC 417	Parallel and Distributed Computing	ITMC323	3
ITMC500	Bsc. Project	ITGS303	4

السنة الرابعة (الفصل الثاني)			
رقم المقرر	إنجليزي -أسم المقرر	مقررات الممهدة	عدد الوحدات
ITMC 426	Mobile Game Developments	ITMC 412	3
ITMC421	Fundamentals ubiquitous computing	ITMC313 ITMC312	3
ITMC422	Cloud Computing and Mobile Applications	ITMC323	3
ITMC423	Mobile Multimedia	ITMC413	3

7. توصيف المقررات التخصصية الإلزامية بهذا القسم

Course title	Mobile Applications		
Course code	ITMC 311	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS211		
Department	Mobile Computing		
Course Description: Development of native-based and hybrid applications for mobile environments taking advantage of gesture-based input and using location and presence services. Topics include introduction to low-level network services and mobile platforms, description of architectural patterns, principles of mobile development and interaction styles for network service usage. Topics Covered: Multi-threaded application development on iOS and Android; Platform agnostic data representations: XML and JSON; Use of advanced widgets: maps; App state: representation, accessing and updating; App communication mechanisms: services, publish and subscribe and intents; The Reactor pattern.			

Course title	Personal Area Networks		
Course code	ITMC 312	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS215		
Department	Mobile Computing		
Course Description: This is a course on the concepts, architecture, design, and performance evaluation of personal area networks protocols and applications. At the conclusion of this course the student will have an understanding of these principles and be capable of implementing network protocols and applications for personal pervasive systems. Topics Covered: Wireless Information devices and wearable computers; PAN applications; PAN issues and challenges; Wireless PAN technology; PAN models and architectures; Wireless Technologies; Wireless LANs; IEEE 802.15, 805.11 standards; Bluetooth technology; Wireless access protocol – WAP; HomeRF protocol; Ad-hoc network protocols; Mobile and wireless networking; PAN middleware and agent architecture; Personal information system.			

Course title	Operating Systems for mobile devices		
Course code	ITMC 315	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS230	ITGS302	
Department	Mobile Computing		
Course Description: Introduction to operating systems designed for mobile devices. Topics covered: A comprehensive overview of Mobile operating systems); the opportunities and challenges in designing them; mobile OS architectures(Android, iOS, Windows), mobile OS features (Multitasking, Scheduling, Memory Allocation, File System Interface, Keypad Interface, I/O Interface, Protection and Security , Multimedia) .			

Course title	Mobile Interaction Design		
Course code	ITMC 321	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 311		
Department	Mobile Computing		
Course Description: This course covers a series of advanced topics in of mobile interaction design. Topics covered, Understanding User Behavior (Knowledge and understanding of theoretical frameworks for understanding human behavior), Interacting with mobile Computing Systems (the design and evaluation of interactive mobile systems), and Interacting with Information (Transferable skills: Information gathering and organizing skills, argumentation skills and the ability to synthesis information from multiple sources), theoretical models of movement and perception (e.g. Fitts' law, Steering law, Hick-Hyman law), and Evaluation of techniques (designing to support information interactions; visual analytics; and evaluating information interaction systems). This project-oriented course and the lab focuses on rapid development tools for building apps on native mobile systems, like the Android, iOS, Windows platform. Introduction to Embedded Mobile Linux.			

Course title	Heterogeneous and Mobile Databases		
Course code	IT`MC322	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS217	ITMC312	
Department	Mobile Computing		
Course Description: A mobile computing environment involves accessing information through a wireless network connection. A mobile database is either a stationary database that can be connected to by a mobile computing device over a mobile network, or a database which is actually stored by the mobile computing device. This course extensively discusses multi-database systems (MDBS) and mobile data access systems (MDAS); moreover, it will studies traditional distributed database issues within the framework of MDBSs and MDASs. Topic include: introduction to Mobile Database System; Database System architectures; Distributed Database systems(Query, Transaction, Recovery and Concurrency control, Security) MDBS (Definition, Issues in MDBS systems, Approaches to MDBS systems, Query Processing, Transaction Processing, Recovery and Concurrency Control, Security); Mobile Data Access systems(Mobility issues, On-demand services, Broadcast services, Transaction, Security). The course balance theory with practice; Students will gain experience working with databases for mobile devices.			

Course title	Application Development with Java ME		
Course code	ITMC 323	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 311		
Department	Mobile Computing		

Course Description:
This course covers J2ME mobile application programming for mobile platforms using the following models:

- Web applications using mobile client frameworks
- Native applications using appropriate SDKs

The core principles covered in this course are those which underpin a practical ability to write code for operating on a mobile platform – OOP for robust application design, library support for mobile web apps and native platforms, UI design for limited screen size, packaging applications and connectivity using online services. Course Topics: Device and Network architecture; Developing Java applications for Android devices; Development Tools; MIDP Programming details (both MIDP 1.0 and 2.0); User Interface and Canvas; Timers, Tasks, Threads, Events; Storage (PIM, File Connection, RMS); Networking, wireless messaging; Performance optimization and tuning; Design for portability; Testing and debugging.

Course title	Security in mobile computing		
Course code	ITMC 411	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITM 312	ITMC315	
Department	Mobile Computing		

Course Description:
This course focuses on aspects of mobile interaction, mobile application, wireless communication that arise in mobile computing. Topics covered: Mobile Interaction (principles of usability, security, and privacy; Methodologies for evaluating usable security; Security and usability analysis Phishing and Risk; Knowledge-based authentication; Biometric and alternative authentication; Security and privacy; Usable security software design principles; Human- in-the- loop design framework; Security indicators and warnings; Usable security for security administrators), Mobile Application (Mobile Platforms, mobile services), Mobile Communication Systems (Mobile cellular telephony; Wireless Internet; Mobile ad hoc; Sensor networks. The course will involve a group project focusing on protocols, programming tasks, vulnerabilities, and attacks.

Course title	Principle of Mobile and Wireless Networks		
Course code	ITMC 412	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 312		
Department	Mobile Computing		

Course Description:
This course gives an introduction to mobile and wireless networks. Designing computer networks to support computer mobility. Mobile network architecture. Wireless technologies and protocols. Wireless LAN standards. Models for indoor and outdoor mobile networks. Systems issues such as performance. Quality of service guarantees, reliability, and security in mobile computing environment. Hardware and access protocols for mobile networks. Mobile application protocols.

Course title	Social Networking		
Course code	ITMC 413	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 323		
Department	Mobile Computing		
Course Description: Introduction to virtual communities overlay networks and social networking. Topics include architectural principles for heterogeneous social networking platforms, trust and reputation as social concepts, agent-based computing, and extraction of trends and patterns from information exchanged between community members. Course requires supervised and unsupervised lab, and intensive programming as a group project and individual assignment.			

Course title	Fundamentals ubiquitous computing		
Course code	ITMC 421	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 312	ITMC315	
Department	Mobile Computing		
Course Description: The aim of this course is to provide students with knowledge and understanding of how computing will be used in the future. It is about moving beyond the traditional desktop computing model, into embedding computing into everyday objects and everyday activities. Topics covered will include the visions of Ubiquitous Computing and some of its applications, Location in Ubiquitous Computing, Context awareness in Ubiquitous Computing, P2P networks systems, Human-computer interaction, Privacy in Ubiquitous Computing.			

Course title	Cloud Computing and Mobile Applications		
Course code	ITMC 422	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 323		
Department	Mobile Computing		
Course Description: Hands-on introduction to cloud computing and developing mobile applications. Topics include: Cloud computing services and infrastructures (virtualization, datacenter networking, wide-area storage/replication, distributed filesystems); development tools (MapReduce, Hadoop, OpenStack); fundamental tradeoffs and algorithms (CAP theorem, NoSQL systems, Paxos) and applications (big-data analysis, real-time data systems, large-scale webservices); iOS and Android programmingto develop mobile applications with backend storage and computing components running on the cloud (Amazon AWS, Microsoft Azure, or Google AppEngine); Accessing cloud services with mobile devices; Extending mobile app with cloud processing and resources; Extending cloud services with the collective power of mobile devices; Partitioning of service functions between mobile devices and clouds; Data management for mobile cloud; Developing mobile cloud services with GAE proxy and Android.			

Course title	Mobile Multimedia		
Course code	ITM C423	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITMC 413		
Department	Mobile Computing		
Course Description: Introduction to the creation, delivery and analysis of multimedia content in systems with mobiledevices. Topics include analysis of webs of documents, social network analysis, recommendersystems and problems of trust, reputation and influence in mobile e-commerce systems. Topics covered:RESTful applications: architecture, JAX-RS, Jersey; Introduction to information retrieval: document structure and similarity; Introduction to (social) network science: types of social network structures and their structural analysis; Creation and analysis of webs of documents: web crawlers, pagerank; Introduction to social network data analysis: tools and simple data mining techniques; Recommender systems; Problems in social networks: trust, reputation, influence and community detection; Introduction to facial and fingerprint recognition; Multimedia content: recognition, transmission and similarity			

8: توصيف المقررات الإختيارية بهذا القسم:

Course title	Programming paradigm		
Course code	ITMC 317	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS211	ITGS226	
Department	Mobile Computing		
Course Description: This course introduces to a variety of programming paradigms, programming languages, and language implementation. Topics include: Object-oriented programming and design; ambient-Oriented Programming; Functional and logical languages; Event-driven programming; Data and demand driven languages; Concurrent programming.			

Course title	Faculty Free Elective		
Course code	ITMC 318	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	-		
Department	Mobile Computing		
Course Description: This course is a subject chosen by the student from amongst subjects are being thought by other departments in the Faculty.			

Course title	Topics in Compiler Construction		
Course code	ITMC 327	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS217	ITGS236	
Department	Mobile Computing		
Course Description: This course is intended to explore the principal ideas and techniques of compiler construction.			

Topics include lexical analyzers, parsers, error detection, code generation, symbol tables, and formal languages

Course title	Mobile 3D Graphics		
Course code	ITMC 416	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITMC 323		
Department	Mobile Computing		
Course Description: The course explores the theory and application software needed for deploying native3D Graphics applications on mobile platforms. The topics covered are: Introduction to Computer Graphics; Graphics Display Devices ; Drawing Based Graphics Primitives ; Transformation of Object - 3D Affine Transformation; Three-Dimensional Viewing ; Tools for Raster Displays ; Scan conversion Algorithms ; Defining and Filling Regions of Pixel; Filling Polygon; Defined Regions; Aliasing: Anti-aliasing Techniques; Creating more Shades and Colors Ray Tracing Algorithm; Virtual camera model optics; Animation; 3D content (file format) is also introduced. It also aims to provide an in depth, practical coverage of two standard application programming interfaces used for mobile 3D graphics, viz., OpenGL-ES-2.0, J2ME-M3G, 3D Studio Max, Ac3d,and Virtual Reality Modeling Language (VRML).			

Course title	Parallel and Distributed Computing		
Course code	ITMC 417	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS236	ITMC323	
Department	Mobile Computing		
Course Description: As multi-core machines become more prevalent, different programming paradigms have emerged for harnessing extra processors for betterperformance. This course explores parallel computation (programs that run on more than one core) as well as the related problem of distributed computation (programs that run on more than one). The goal of the course is to introduce students to parallel and distributed processing, including both theory and hands-on experience. Topics covered: An overview of parallel computing; Languages and programming environments; Message-passing computing; Embarrassingly parallel computations; Partitioning and divide-and-conquer strategies; Pipelined computations; Synchronous computations; Load balancing and termination detection; Programming with shared memory; Algorithms and applications.			

Course title	Mobile Games Development		
Course code	ITMC 426	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITMC 321	ITMC416	
Department	Mobile Computing		
Course Description: This class is designed to cover a number of topics in game design and programming on mobile platforms. Topics covered: Principle of game design on mobile platforms; UI design and algorithms for designing and implementing games; foundations of game design; practical usage of modern game engines, such as Cocoa2D and Unity; User experience design; Access methods; Use of multimedia. Detailed topics include: Complexity handling, resource efficient programming; Memory leak and abnormality testing; Reusability and separation with MVC.			

Course title	Mobile Commerce		
Course code	ITMC 326	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITMC 311		
Department	Mobile Computing		
Course Description: This course introduces students to the basics of Mobile Commerce. Topics include: introduction Mobile Commerce (Infrastructure of M–Commerce ; Types of M–Commerce Services ; Technologies of Wireless Business ; Benefits and Limitations, Support, Mobile Marketing and Advertisement; Non – Internet Applications in M–Commerce ; Wireless/Wired Commerce Comparisons); Mobile Commerce: Technology (A Framework for the study of M–Commerce; NTT Docomo's I – Mode ; Wireless Devices for M–Commerce; Towards a Classification Framework for Mobile Location Based Services ; Wireless Personal and Local Area Networks ; The Impact of Technology Advances on Strategy Formulation in Mobile Communications Networks); Mobile Commerce: Theory and Practices (The Ecology of M–Commerce; The Wireless Application Protocol ;Mobile Business Services ; Mobile Portal ; Factors Influencing the Adoption of Mobile Gaming Services ; Mobile Data Technologies and Small Business Adoption and Diffusion ; M–Commerce in the Automotive Industry ; Location – Based Services: Criteria for Adoption and Solution Deployment ; The Role of Mobile Advertising in Building a Brand ; M–Commerce Business Models); Business – To – Business Mobile E-Commerce (Enterprise Enablement ; Email and Messaging ; Field Force Automation (Insurance, Real Estate, Maintenance, Healthcare) ; Field Sales Support (Content Access, Inventory) ; Asset Tracking and Maintenance/Management ; Remote IT Support ; Customer Retention (B2C Services, Financial, Special Deals) ; Warehouse Automation ; Security.			

Course title	Special Topics		
Course code	ITMC 328	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	-		
Department	Mobile Computing		
Course Description: This course is a topic or a collection of topics selected by Mobile Computing Department according to the current developments in technology, curriculum, and job market.			

Course title	ARM microprocessor		
Course code	ITMC 316	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	IT223		
Department	Mobile Computing		
Course Description: This course on 32 bit ARM Programming covers in-depth learning of ARM processors, its architecture, Programming for both ARM7 and ARM9 families. Also included are Introduction to GNU tool chain, ARM programming model, Exception handling, Introduction to thumb instruction set, ARM THUMB procedure call standards (ATPCS), ARM optimization techniques, Building RTOS image and porting.			

Course title	Faculty Free Elective		
Course code	ITMC 427	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	-		
Department	Mobile Computing		
Course Description: This course is a subject chosen by the student from amongst subjects are being thought by other departments in the Faculty.			

Course title	University Free Elective		
Course code	ITMC 428	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	-		
Department	Mobile Computing		
Course Description: This course is a subject chosen by the student from amongst subjects are being thought by other Faculties in the University.			

9. الإحتياجات المعملية:

تمتلك كلية تقنية المعلومات الموارد المعملية الكافية لتغطية الجانب العملي للتخصص ، حيث ان القسم سيستفيد من المعامل الحديثة للكلية خصوصا المعمل المجهز من قبل شركة سامسونغ والذي سيدخل حيز العمل بالتزامن مع إفتتاح القسم.

جامعة طرابلس
كلية تقنية المعلومات

مقترح إنشاء

قسم نظم المعلومات

إعداد: لجنة قسم نظم المعلومات

2014 / 05 / 25

جدول المحتويات

مقترح إنشاء قسم نظم المعلومات

1. مقدمة:

يهتم قسم نظم المعلومات بكيفية استخدام تكنولوجيا المعلومات وممارستها وتطبيقها في جميع المجالات الخدمية و التقنية لهذا يعتبر هذا التخصص همزة الوصل بين تخصصات علوم الحاسب ومجالات العمل المختلفة ، يتمكن الطلاب من خلاله اكتساب المعارف والمهارات اللازمة لتحليل وتصميم وتطوير وتشغيل نظم المعلومات ، كما أن القسم يغطي أغلب مجالات البحث في نظم المعلومات كتحليل وتصميم النظم وتطوير البرامج وإدارة المشاريع ونظم دعم القرارات.

فأهمية مخرجات هذا القسم لتلبية احتياجات المجتمع المتزايدة في هذا المجال أصبحت ملحة ، فمن هنا جاءت فكرة أنشاء القسم لتأهيل و إعداد كوادر للأسهام الفعال في تلبية احتياجات سوق العمل و خطط التنمية.

عليـــــه تعتزم كلية تقنية المعلومات إفتتاح قسم نظم المعلومات وذلك الفصل الدراسي القادم خريف 2015/2014.

لقد تم إعداد هذا المقترح بناءً على مقاييس الجودة أخذين بعين الإعتبار متطلبات الإعتماد المؤسسي والبرامجي محليا ودوليا. ولضمان الحصول على خريجين ذو مهارات عالية لهم القدرة على المنافسة محليا وعالميا، لقد تم البحث والرجوع إلى مصادر وجمعيات متخصصة في وضع مناهج تخصص نظم المعلومات مثل(Association for Computing Machinery (ACM: و Association for Information Systems (AIS). هذا سيجعل من خريجينا يتمتعون بمهارات مكافئة لنظرائهم في هذا المجال، والذي بدوره سيمكنهم من مواصلة دراستهم العليا والدقيقة محليا وخارجيا بكفاءة وتقة عاليتين.

2. الرؤية:

إعداد الطلاب إعدادا متميزا وإكسابهم المهارات اللازمة للعمل في مجال نظم المعلومات

3. الرسالة:

تخريخ الكوادر المؤهلة علميا و مهنيا في مجالات نظم المعلومات من خلال تقديم برامج تعليمية متميزة تتفق مع معايير الجودة و تحقق متطلبات سوق العمل.

4. الأهداف:

1. تخريج إخصائيي تقنيات معلومات مدربين جيدا على أحدث التقنيات في المجال سواء في الجانب النظري أو الممارسة العملية .
2. المساهمة الفعالة في الدراسات والبحوث واكتشاف المعارف والأساليب الحديثة في مجال نظم المعلومات.
3. تقديم الأسس الضرورية والحديثة لطلاب البكالوريوس (في النظرية والتطبيق) في مجال نظم المعلومات.
4. تمكين الطلاب من خلال تعريفهم بالأدوات والمهارات اللازمة لتقديم خدمة فعالة لصناعة تقنية المعلومات واحتياجات المجتمع بعد التخرج.
5. توفير الاستشارات والخدمات المجتمعية في مجال تقنية المعلومات.
6. تزويد الطلاب بالمهارات اللازمة لتطبيق علوم نظم المعلومات.

7. تكوين قاعدة علمية قوية عند الطلاب تساعدهم في مواكبة التغيير السريع في المجال والتفاعل معه ايجابيا.
8. المساهمة في تزويد سوق العمل بالكوادر الوطنية بما يسد احتياجات الأعمال في هذا المجال الحيوي.

5. مهام ومسئوليات متخصصي نظم المعلومات :

يركز متخصصو أنظمة المعلومات على الدمج بين الحلول التقنية لأنظمة المعلومات وبين العمليات المرتبطة بالأعمال التجارية وذلك من أجل تلبية إحتياجات منظمات الأعمال التجارية للمعلومات بحيث تمكنها من انجاز أهدافها بكفاءة وفعالية.

وبالنسبة للمحترفين في هذا التخصص فإنهم يهتمون بشكل رئيسي بالمعلومات التي يمكن الحصول عليها من الأنظمة الحاسوبية وذلك لمساعدة المشاريع في تعريف أهدافها وانجازها . ويركزون أيضا على العمليات التي يمكن أن تنفذها هذه المشاريع من أجل تحسين طرق استخدام تقنية المعلومات . وللقيام بذلك لا بد من فهم كلا من العوامل التقنية والمؤسسية للعمل.

وغالبا ما يقوم متخصصو نظم المعلومات بالتوفيق بين تقنيات التطبيقات ، وخاصة تلك المتعلقة بقواعد البيانات ، وبين متطلبات وحاجيات المشاريع ، فهم يقومون بتطوير أنظمة تستطيع الإستفادة من تطبيقات برمجية أخرى لكي تتناسب مع متطلبات المؤسسة من المعلومات.

6. متطلبات القسم الدراسية :

يوزع البرنامج الدراسي (الخطة الدراسية) لقسم نظم المعلومات على ثمانية فصول دراسية (أربع سنوات) على أن يتضمن برنامج الإجازة المتخصصة (البكالوريوس) عدد 135 وحدة دراسية يجب على الطالب إجتيازها للحصول على درجة البكالويوس في تخصص نظم المعلومات. تقسم هذه الوحدات على النحو التالي:

- 8 وحدات دراسية تمثل المقررات العامة التي تطلبها الجامعة.
- 15 وحدة دراسية تمثل متطلبات الكلية العامة.
- 57 وحدة دراسية تمثل متطلبات الكلية التخصصية
- 40 وحدة دراسية تمثل متطلبات القسم التخصصية، تشتمل على مشروع التخرج للطالب بعدد 4 وحدات.
- 15 وحدة دراسية تمثل متطلبات القسم التخصصية الإختيارية.

الجداول التالية توضح توزيع هذه الوحدات على المتطلبات المذكورة، بالإضافة إلى المواد التمهيدية لكل مادة.

1.6. متطلبات الجامعة:

يستوجب على الطالب إجتياز عدد 4 مقررات جامعية، بعدد 2 وحدات دراسية لكل مقرر، مع ضرورة إجتياز المقررات التمهيدية إن وجدت كما موضح بالجدول التالي:

Prerequisite	Credits	Course Title	Course Title	Course number
-	2	Arabic Language I	لغة عربية 1	ITAR111
-	2	English Language I	لغة إنجليزية 1	ITEL111
ITAR111	2	Arabic Language II	لغة عربية 2	ITAR121
ITEL111	2	English Language II	لغة إنجليزية 2	ITEL121
	8			**المجموع**

2.6. متطلبات الكلية

1.2.6. مواد إلزامية غير تخصصية للمرحلة العامة:

يستوجب على الطالب إجتياز عدد 5 مقررات جامعية إلزامية غير تخصصة، بحسب عدد الوحدات لكل مقرر، مع ضرورة إجتياز المقررات التمهيدية إن وجدت كما موضح بالجدول التالي:

Prerequisite	Credits	Title in English	Title in Arabic	Course Code
-	3	Mathematics 1	رياضة 1	ITMM111
-	3	Introduction to statistics and probability	مبادئ الاحصاء و الاحتمالات	ITST111
ITMM111	3	Mathematics 2	رياضة 2	ITMM121
-	3	Physics (Electronic and Magnetic)	فيزياء (الكترونية و مغناطيسية)	ITPH111
ITMM121, ITGS122	3	Numerical Analysis	الطرق العددية	ITGS219
15				مجموع الوحدات

2.2.6. مواد إلزامية تخصصية للمرحلة العامة:

يستوجب على الطالب إجتياز عدد 18 مقرر جامعي إلزامي تخصصي، بعدد 3 وحدات دراسية لكل مقرر، مع ضرورة إجتياز المقررات التمهيدية إن وجدت كما موضح بالجدول التالي:

المقرر التمهيدي	الوحدات	إسم المادة (الانجليزية)	اسم المادة (عربي)	رمز المادة
-	3	Introduction to Information Technology	مقدمة في تقنية المعلومات	ITGS111
-	3	Problem Solving Techniques	تقنيات حل المشاكل	ITGS113
ITGS113	3	Introduction to Programming	مقدمة في البرمجة	ITGS122
ITGS113	3	Systems Analysis and Design	تحليل و تصميم نظم	ITGS124
ITPH111	3	Logic Circuits	الدوائر المنطقية	ITGS126
ITGS122	3	Object Oriented Programming	البرمجة الشيئية	ITGS211
ITGS111	3	Introduction to Software Eng.	مقدمة في هندسة البرمجيات	ITGS213
ITGS111	3	Introduction to Networking	مقدمة في الشبكات	ITGS215
ITMM122	3	Discrete Structures	التراكيب المنفصلة	ITGS217
ITGS122	3	Data Structures	هياكل البيانات	ITGS220
ITGS111	3	Foundations of Information Systems	أساسيات نظم المعلومات	ITGS222
ITGS126	3	Computer Architecture	معمارية الحاسوب	ITGS223
ITGS111	3	Information Security	أمن المعلومات	ITGS224
ITGS122	3	Introduction to Internet Programming	مقدمة في برمجة الانترنت	ITGS226
ITGS217	3	Introduction to Databases	مقدمة في قواعد البيانات	ITGS228
ITGS220	3	Design and Analysis of Algorithms	تصميم و تحليل الخورزميات	ITGS301
ITGS223	3	Operating Systems	نظم تشغيل	ITGS302
ITGS213	3	IT Project Management	إدارة مشاريع	ITGS303
ITEL121	3	Scientific Writing (English 3)	كتابة تقارير (لغة انجليزية3)	ITGS304
57				مجموع الوحدات

3.6. متطلبات القسم:

يشترط لتخصص الطالب في قسم نظم المعلومات أن يجتاز بنجاح مادة " أساسيات نظم المعلومات " و يشمل متطلبات القسم المقررات التخصصية والإختيارية التالية:

1.3.6. مقررات القسم التخصصية:

يستوجب على الطالب إجتياز عدد 12 مقرر كمتطلبات القسم التخصصية، بعدد 3 وحدات للمقررات النظرية ، كما هو موضح بالجدول التالي:

رمز المادة	إسم المادة (عربي)	إسم المادة (إنجليزي)	عدد الوحدات	المواد التمهيدية
ITIS311	تطوير التطبيقات	Application Development	3 (1+2)	ITGS222
ITIS312	التفاعل بين الإنسانوالحاسوب	Human-Computer Interaction	3 (1+2)	ITGS124
ITIS323	البنية التحتية لنظم المعلومات	IS Infrastructure	3 (0+3)	ITGS222
ITIS324	نظم الوسائط المتعددة	Multimedia Systems	3 (1+2)	ITGS122
ITIS325	قاعدة بيانات متقدمة	Advanced Database	3 (1+2)	ITGS228
ITIS326	(ERP) تحليل وتصميم النظم 2	Systems Analysis and 2(ERP) Design	3 (1+2)	ITGS124+ITGS222
ITIS417	البنيان المؤسساتي	Enterprise Architecture	3 (1+2)	ITGS222
ITIS313	إدارة البيانات والمعلومات	Data and Information Management	3 (0+3)	ITGS222
ITIS412	الأمن وإدارة المخاطر	Security and Risk Management	3 (0+3)	ITGS222
ITIS413	مقدمة في الذكاء الإصطناعي	Introduction to Artificial Intelligence	3 (1+2)	ITGS211
ITIS421	النظم المؤسساتية	Enterprise Systems	3 (1+2)	ITGS222
ITIS422	إستراتيجية نظم المعلومات	IS Strategy, Management and Acquisition	3 (0+3)	ITIS311+ITIS312 + ITIS323+ ITIS326+ ITIS417+ ITIS313+ ITIS412+ITIS421
ITIS500	المشروع	BSc. Project	4	ITGS303
المجموع			40	

2.3.6. مواد تخصصية إختيارية:

من ضمن المقررات الدراسية الذي ينبغي على الطالب دراستها هي المواد التخصصية الاختارية للقسم فعلى الطالب دراسة (5) مواد دراسية أختيارية من أصل (9) مواد كما هو موضح فى الجداول التالية.

Code	Course Title	Course in Arabic	Credits	Prerequisite
ITIS401	Information Search and Retrieval	بحث و أسترجاع المعلومات	3 (2+1)	ITGS211
ITIS402	Knowledge Management	إدارة المعرفة	3 (3+0)	ITIS413
ITIS403	Collaborative Computing Systems	نظام الحوسبة التعاونية	3 (3+0)	ITGS213

ITIS404	Data Mining / Business Intelligence	تنقيب البيانات / الذكاء التجاري	3 (2+1)	ITGS301
ITIS405	Business Process Management	إدارة العملية التجارية	3 (3+0)	ITIS326
ITIS406	Decision Support Systems	أنظمة دعم القرار	3 (2+1)	ITGS211
ITIS407	IS Innovation and New Technologies	الابتكار و التقنيات الجديدة	3 (2+1)	ITIS326
ITIS408	E – Government	الحكومة الالكترونية	3 (2+1)	ITGS224+ ITGS226
ITIS409	Audit and controls	المراجعة و الضوابط	3 (3+0)	ITIS313

7. توزيع المواد الدراسية على الفصول الدراسية

الجدول التالي يوضح توزيع المواد الدراسية على الفصول الدراسية وأسبقياتها، بالإضافة إلى المواد التمهيدية لكل مادة.

Semester	Code	Course Title	Credit	Prerequisite
Year 1: First Semester	ITGS111	Introduction to Information Technology	3	-
	ITGS113	Problem Solving Techniques	3	-
	ITMM111	Mathematics 1	3	-
	ITPH111	Physics	3	-
	ITAR111	Arabic Language I	2	-
	ITEL111	English Language I	2	-
Year 1: Second Semester	ITGS122	Introduction to Programming	3	ITGS113
	ITGS124	System Analysis and Design	3	ITGS113
	ITGS126	Logic Circuits	3	ITPH111
	ITMM122	Mathematics 2	3	ITMM111
	ITAR122	Arabic Language II	2	ITAR111
	ITEL122	English Language II	2	ITEL111
Year 2: Third Semester	ITGS211	OO Programming	3	ITGS122
	ITGS213	Introduction to Software Engineering	3	ITGS111
	ITGS215	Introduction to Networking	3	ITGS111
	ITGS217	Discrete Structures	3	ITMM122
	ITGS219	Numerical Methods	3	ITMM122, ITGS122
	ITMM211	Statistics & Probability	3	ITMM111
Year 2: Forth Semester	ITGS220	Data Structures	3	ITGS122
	ITGS222	Foundations of IS	3	ITGS111
	ITGS224	Information Security	3	ITGS111
	ITGS226	Introduction to Internet Programming	3	ITGS122
	ITGS228	Introduction to Databases	3	ITGS217
	ITGS223	Computer Architecture	3	ITGS126
	ITGS302	Operating Systems	3	ITGS223
	ITIS311	Application Development	3	ITGS222
	ITIS312	Human Computer Interaction	3	ITGS124

Year 3: Fifth Semester	ITIS313	Data & Information Management	3	ITGS222
	ITGS304	Scientific writing (English Language 3)	3	ITEL121
		Elective		
Year 3: sixth Semester	ITGS301	Design and Analysis of Algorithms	3	ITGS220
	ITIS323	IS Infrastructure	3	ITGS222
	ITIS324	Multimedia Systems	3	ITGS122
	ITIS325	Advanced Database	3	ITGS228
	ITIS326	Systems Analysis and Design II (ERP)	3	ITGS124+ITGS222
		Elective	3	
Year 4: Seventh Semester	ITGS303	IT Project Management	3	ITGS213
	ITIS411	Enterprise Architecture	3	ITGS222
	ITIS412	Security and Risk Management	3	ITGS222
	ITIS413	Introduction to Artificial Intelligence	3	ITGS211
		Elective	3	
	ITIS500	BSc Project	4	ITGS303
Year 4: Eighth Semester	ITIS421	Enterprise Systems	3	ITGS222
	ITIS422	IS Strategy, Management and Acquisition	3	ITIS311+ ITIS312+ ITIS323+ ITIS326+ ITIS417+313+ ITIS412+ITIS421
		Elective	3	
		Elective	3	
	ITIS500	BSc Project		ITGS303

8. توصيف المواد

1.8. المواد التخصصية الإلزامية:

Course title	Foundations of Information Systems		
Course code	ITGS222	Credits	3
Course type	Core ☒	Required ☐	Elective ☐
Prerequisites code	ITGS111		
Department	Information Systems		
Course Description: Information systems are an integral part of all business activities and careers. This course is designed to introduce students to contemporary information systems and demonstrate how these systems are used throughout global organizations. The focus of this course will be on the key components of information systems - people, software, hardware, data, and communication technologies, and how these components can be integrated and managed to create competitive advantage. Through the knowledge of how IS provides a competitive advantage students will gain an understanding of how information is used in organizations and how IT enables improvement in quality, speed, and agility. This course also provides an introduction to systems and development concepts, technology acquisition, and various types of application software that have become prevalent or are emerging in modern organizations and society.			

Course title	Data and Information Management		
Course code	ITIS313	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS222		
Department	Information Systems		
Course Description: This course provides the students with an introduction to the core concepts in data andinformation management. It is centered around the core skills of identifying organizational information requirements, modeling them using conceptual data modellingtechniques, converting the conceptual data models into relational data models andverifying its structural characteristics with normalization techniques, and implementingand utilizing a relational database using an industrial-strength database managementsystem. The course will also include coverage of basic database administration tasks andkey concepts of data quality and data security. In addition to developing databaseapplications, the course helps the students understand how large-scale packaged systemsare highly dependent on the use of DBMSs. Building on the transactional databaseunderstanding, the course provides an introduction to data and information managementtechnologies that provide decision support capabilities under the broad businessintelligence umbrella.			

Course title	Enterprise Architecture		
Course code	ITIS326	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS222		
Department	Information Systems		
Course Description: This course explores the design, selection, implementation and management of enterpriseIT solutions. The focus is on applications and infrastructure and their fit with thebusiness. Students learn frameworks and strategies for infrastructure management,system administration, data/information architecture, content management, distributedcomputing, middleware, legacy system integration, system consolidation, softwareselection, total cost of ownership calculation,			

IT investment analysis, and emergingtechnologies. These topics are addressed both within and beyond the organization, withattention paid to managing risk and security within audit and compliance standards.Students also hone their ability to communicate technology architecture strategiesconcisely to a general business audience.

Course title	IS Infrastructure		
Course code	ITIS323	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS222		
Department	Information Systems		
Course Description: This course provides an introduction to IT infrastructure issues for students majoring inInformation Systems. It covers topics related to both computer and systems architectureand communication networks, with an overall focus on the services and capabilities thatIT infrastructure solutions enable in an organizational context. It gives the students theknowledge and skills that they need for communicating effectively with professionalswhose special focus is on hardware and systems software technology and for designingorganizational processes and software solutions that require in-depth understanding of theIT infrastructure capabilities and limitations. It also prepares the students fororganizational roles that require interaction with external vendors of IT infrastructurecomponents and solutions. The course focuses strongly on Internet-based solutions,computer and network security, business continuity, and the role of infrastructure inregulatory compliance.			

Course title	Systems Analysis & Design 2 (ERP)		
Course code	ITIS302	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS124+ITGS222		
Department	Information Systems		
Course Description: This course discusses the processes, methods, techniques and tools that organizations useto determine how they should conduct their business, with a particular focus on howcomputer-based technologies can most effectively contribute to the way business isorganized. The course covers a systematic methodology for analyzing a business problemor opportunity, determining what role, if any, computer-based technologies can play inaddressing the business need, articulating business requirements for the technologysolution, specifying alternative approaches to acquiring the technology capabilitiesneeded to address the business requirements, and specifying the requirements for theinformation systems solution in particular, in-house development, development fromthird-party providers, or purchased commercial-off-the-shelf (COTS) packages.			

Course title	IS Strategy, Management & Acquisition		
Course code	ITIS422	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITIS (311,312,323,326,417,313,412,421)		
Department	Information Systems		
Course Description: This course explores the issues and approaches in managing the information systemsfunction in organizations and how the IS function integrates / supports / enables varioustypes of organizational capabilities. It takes a senior management perspective inexploring the acquisition, development and implementation of plans and policies toachieve efficient and effective			

information systems. The course addresses issues relatingto defining the high-level IS infrastructure and the systems that support the operational,administrative and strategic needs of the organization. The remainder of the course isfocused on developing an intellectual 556framework that will allow leaders of organizationsto critically assess existing IS infrastructures and emerging technologies as well as howthese enabling technologies might affect organizational strategy. The ideas developed andcultivated in this course are intended to provide an enduring perspective that can helpleaders make sense of an increasingly globalized and technology intensive businessenvironment.

Course title	Application Development		
Course code	ITIS311	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS222		
Department	Information Systems		
Course Description: The purpose of this course is to introduce the students to the fundamental concepts and models of application development so that they can understand the key processes related to building functioning applications and appreciate the complexity of application development. Students will learn the basic concepts of program design, data structures, programming, problem solving, programming logic, and fundamental design techniques for event-driven programs. Program development will incorporate the program development life cycle: gathering requirements, designing a solution, implementing a solution in a programming language, and testing the completed application.			

Course title	Enterprise Systems		
Course code	ITIS421	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS222		
Department	Information Systems		
Course Description: This course is designed to provide students with an understanding of the theoretic and practical issues related to the application of enterprise systems within organizations. The main focus of this course is to demonstrate how enterprise systems integrate information and organizational processes across functional areas with a unified system comprised of a single database and shared reporting tools. Enterprise systems, by their multi-dimensional integrative nature, offer the depth of functionality and breadth of integration to demonstrate how global operations of organizations are managed. Thus, students will gain an appreciation of the scope of enterprise systems and the motivation for implementing them. [Optional: Example software will be used to illustrate how enterprise systems work. An integrated project, which requires the application of conceptual as well as technical (software) skills of students, will be required.			

Course title	Introduction to Human-Computer Interaction		
Course code	ITIS312	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS124		
Department	Information Systems		
Course Description: This course provides an introduction to the field of human-computer interaction (HCI), an interdisciplinary field that integrates cognitive psychology, design, computer science and others. Examining the human factors associated with information systems provides the			

students with knowledge to understand what influences usability and acceptance of IS. This course will examine human performance, components of technology, methods and techniques used in design and evaluation of IS. Societal impacts of HCI such as accessibility will also be discussed. User-centered design methods will be introduced and evaluated. This course will also introduce students to the contemporary technologies used in empirical evaluation methods.

Course title	Multimedia Systems		
Course code	ITIS324	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS122		
Department	Information Systems		
Course Description: The course is a basic grounding in issue surrounding multimedia design and multimedia data. It enhances the student's view about graphics and images. The course will cover the following: digital audio, graphics, still images and videos, animation. Also it includes data compression and transmission of media, as well as software tools used for integrating digital media.			

Course title	Advanced Database		
Course code	ITIS325	Credits	4
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS228		
Department	Information Systems		
Course Description: Students will be able to: Develop scalable, distributed applications with SQL to meet organizational requirements. Create modular code using stored procedures and formulate triggers, Develop reusable code with stored procedures and functions, Handle SQL runtime errors to create robust software Audit data changes using triggers. Contents of this subject: 1- Data definition. Managing Tables with DDL, Creating schemas, Referencing schemas versus using the default schema, hiding schemas with synonyms. 2- Building tables, Adding and enforcing constraints. 3- Declaring variables and parameters, Creating and utilizing local variables, Passing input and output parameters, Calling built-in scalar functions, Converting data using CAST and CONVERT, Ordering data with ranking functions, Maintaining Data, Modifying data. 4- Creating Views, Stored Procedures and Stored procedure compilation and execution. 5- Auditing and implementing constraint on data by the means of Triggers. 6- Handling errors by communicating problems to the client with RAISERROR, Intercepting errors with TRY...CATCH.			

Course title	Security and Risk Management		
Course code	ITIS412	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	ITGS222		
Department	Information Systems		
Course Description: This course provides an introduction to the fundamental principles and topics of information Technology Security and Risk Management at the organizational level. Students will learn critical security principles that enable them to plan, develop, and perform security tasks. The course will address hardware, software, processes, communications, applications, and policies and procedures with respect to organizational IT Security and Risk Management.			

Course title	Introduction to Artificial Intelligence		
Course code	ITIS413	Credits	3
Course type	Core ☐	Required ☒	Elective ☐
Prerequisites code	None		
Department	Information Systems		

Course Description:
This course is an introductory course to artificial intelligence. The goal of this course is to provide students with the underlying principle of the artificial intelligence and soft computing paradigms with their advantages over traditional computing. Topics to be covered will include: Introduction to Intelligent Systems: Tools, Techniques and Applications; Expert Systems; Fuzzy Systems; Artificial Neural Networks; Genetic Algorithms; Case-based Reasoning; Data Mining; Intelligent Software Agents; Language Technology.

2.8. توصيف المواد التخصصية الإختيارية:

Course title	Information Search and Retrieval		
Course code	ITIS401	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS211		
Department	Information Systems		
Course Description: This course studies the theory, design, and implementation of text-based information systems. The Information Retrieval core components of the course include statistical characteristics of text, representation of information needs and documents, several important retrieval models (Boolean, vector space, probabilistic, inference net, language modeling, link analysis), clustering algorithms, collaborative filtering, automatic text categorization, and experimental evaluation. The software architecture components include design and implementation of high-capacity text retrieval and text filtering systems.			

Course title	Business Process Management		
Course code	ITIS405	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	None		
Department	Information Systems		
Course Description: In this course students will be introduced to key concepts and approaches to business process management and improvement. The main focus of this course is both understanding and designing business processes. Students will learn how to identify, document, model, assess, and improve core business processes. Students will be introduced to process design principles. The way in which information technology can be used to manage, transform, and improve business processes is discussed. Students will be exposed to challenges and approaches to organizational change, domestic and offshore outsourcing, and inter-organizational processes.			

Course title	Audit and Controls		
Course code	ITIS409	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITIS313		
Department	Information Systems		
Course Description: This course introduces the fundamental concepts of the information technology audit and control function. The main focus of this course is on understanding information controls, the types of controls and their impact on the organization, and how to manage and audit them. The concepts and techniques used in information technology audits will be presented. Students will learn the process of creating a control structure with goals and objectives, audit an information technology infrastructure against it, and establish a systematic remediation procedure for any inadequacies. The challenge of dealing with best practices, standards, and regulatory requirements governing information and controls is addressed.			

Course title	Decision Support Systems		
Course code	ITIS406	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS211		
Department	Information Systems		

Course Description:
The course establishes a foundation for understanding and analysing information and information systems in organisations. It also provides an overview of technical and organisational aspects of decision support systems (DSS), including individual, group and organisational DSS as well as executive information systems (EIS). Management of DSS and EIS within the end-user computing environment is also discussed. The course covers more recent technologies, e.g. Data Warehouse and OLAP-technologies. The course is design-oriented and emphasises conceptual foundations of DSS and EIS, but DSS software reviews, demonstrations, laboratory lessons and case examples are also included.

Course title	Data Mining/Business Intelligence		
Course code	ITIS404	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS301		
Department	Information Systems		
Course Description: This course will define the notion of Business Intelligence and its components. It will change the way students think about data and its role in business. The goal of the course is to examine how data mining technologies can be used to improve decision-making. The topics will be covered include, Introduction to data mining and data mining process (identify business problem, build mining database, prepare data for modelling, build and evaluate model); Predictive Modelling; Descriptive/ Unsupervised Data Mining; Data Mining for business applications; Data mining and electronic commerce, Data warehousing: concepts and techniques; Data Warehouse Architecture; Data Warehousing to improve decision-making in business.			

Course title	Knowledge Management		
Course code	ITIS402	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITIS413		
Department	Information Systems		
Course Description: The course will be conducted in a seminar style to develop students' analytical abilities in the area of KM and knowledge management systems. Topics included: Overview of Knowledge Management; The Nature of Knowledge; Knowledge Management Solutions; Organizational Impacts of Knowledge Management; Factors Influencing Knowledge Management; Knowledge Management Assessment of an Organization; Technologies to Manage Knowledge (Artificial Intelligence, Digital Libraries, Repositories, etc); Preserving and Applying Human Expertise: Knowledge-Based Systems; Using Past History Explicitly as Knowledge (Case-Based Systems); Knowledge Elicitation (Converting Tacit Knowledge to Explicit); Discovering New Knowledge (Data Mining); Systems (Knowledge Discovery, Systems that Create Knowledge; Knowledge Capture Systems; Systems that Preserve and Formalize Knowledge; Concept Maps, Process Modeling, RSS, Wikis, Delphi Method; Knowledge Sharing Systems: Systems that Organize and Distribute Knowledge; Ontology Development Systems, Categorization and Classification Tools, XML-Based Tools). Class time will be divided into lecture, discussions, and student presentations.			

Course title	Collaborative computing systems		
Course code	ITIS403	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS213		

Department	Information Systems
Course Description: This course explores the design, use and evaluation of technologies that support teams, groups and communities. It is an interdisciplinary topic that addresses both the technical and social aspects of collaboration technology. Topics include: Introduction to Collaborative computing system; Awareness and coordination; Computer mediated communication; Distributed cognition; Collaborative computing system frameworks; Empirical methods in CSCW; Technologies including Groupware, Mobile devices, Large and shared displays, and Collaborative visualization; Collaboratories including Knowledge management; Social media; Application domains: Software engineering, Education, Medical informatics and Health Applications, Arts and Humanities, and science. There will be team project in this course.	

Course title	E-Government		
Course code	ITIS408	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITGS224+ TGS226		
Department	Information Systems		
Course Description: This course is an introduction to electronic government (e-government). Our basic premise that the governments' use of Information and Communication Technology (ICT) is not an end in itself, certainly not a technical exercise, but a tool to achieve better government. e-Government includes all measures to further this goal with the combination of ICT and the necessary organisational improvement. This definition is the point of departure for the rest of the course that covers: reasons to embrace e-government, challenges to e-government, planning of e-government, front-office and back-office implementations, and the management of e-government projects.			

Course title	IS Innovation and New Technologies		
Course code	ITIS407	Credits	3
Course type	Core ☐	Required ☐	Elective ☒
Prerequisites code	ITIS326		
Department	Information Systems		
Course Description: New IS technologies are being used to change how organizations operate, produce products and services, and communicate both internally and as well as with external partners. This course is designed to introduce students to new and innovative technologies and examine how these powerful systems have fundamentally reshaped modern organizations along with our society. Using online collaborative technologies that were developed in the context of social networking and online communities, corporations are reengineering both internal business processes and those related to customers, suppliers, and business partners. Developing innovative ways to communicate and collaborate can lead to new business opportunities, and new efficiencies. This course investigates the technologies, methods and practices of developing new innovations such as online communities, and how this knowledge and these skills are applied to reengineer business processes.			

9. الإحتياجات المعملية:

تمتلك كلية تقنية المعلومات الموارد المعملية الكافية لتغطية الجانب العملي للتخصص، حيث ان القسم سيستفيد من المعامل الحديثة للكلية والتي ستدخل حيز العمل بالتزامن مع إفتتاح القسم.